

VOL. 43, No. 9

SEPTEMBER 1975

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COVER PHOTO

A top view of the works of the excellent Kenwood TR-7200G 2 metre FM transceiver which is reviewed on page 13 of this issue.

PHOTO: KEN REYNOLDS



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5 Watts AM, 12V DC Operation
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COMMUNICATION RECEIVERS AND
TRANSCEIVERS

KENWOOD MODEL TS639 AC-DC, 80-160 metre,
complete with microphone \$550

Matching External Speaker \$25

KEN TR7200G 2 metre, 22 channel, 12V DC
operation, fitted with Ch. 1 and 4 Repeaters, 10W
and 1W output positions \$235

YAESU MUSEN FT101B AC-DC, 160-10 metre,
complete with microphone \$545

FT200 Transceiver with A.C. power supply \$400

KEN KP202 hand held 2 metre Transceiver, 2 Watts
output, fitted with state for channels 40 and 50,
repeaters 1, 2, 3 and 4 \$150

KCP2 Battery Charger for KP202 with 10 recharge-
able Ni-Cad batteries \$35

KENWOOD QR-856 general coverage, operates from
240V AC or 12V DC \$330

BARLOW WADLEY XCR90 Mk II, all band coverage,
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MICROPHONES

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Brand new.

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"PHILIPS" TYPE CONCENTRIC TRIMMERS
Threaded stud mounting, 25 pF.

75c

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CARTRIDGE PLAYERS

2-5 Watts per channel at 8 ohms, 12V DC
operation. In sealed boxes.

\$15 each

30 kHz M.E.W. Crystal Filters 10.7 MHz
\$5 each

2N3055 Transistors with insulating kit \$1.00
Stolle 300 ohm Feeder with foam dielectric
15c yard

58 ohm Coax Cable 100 yd. Rolle, 1/4"
diam. \$12 Roll

52 ohm Coax Cable 1/4" diam. 45c yard,
50c metre

Dow Key Coaxial Relays 48 Volt DC
operation \$15

Split Stator Capacitors with screwdriver
slot drive, 9 pF-17 pF-25 pF. Brand new
Eddystone type \$4.50 ea.

Ex Army Headphones approx. 20 ohms im-
pedance. New, in sealed boxes \$2.00

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2" Square Face 0-10 mA Meters, calibrate
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Jackson Slow Motion Drives 6:1 ratio \$2.30

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operation \$2.00

MINIATURE SIEMENS RELAYS
4 sets changeover contacts, 6-12V DC
operation. Type V23154. New.

\$4 each

6 TRANSISTOR RADIO CHASSIS \$1 each

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16ft., complete with base
\$12

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prox. 15 Watts output. With 24V DC PSU.

\$49

C11 TRANSMITTERS
2-16 MHz, AM or CW, 50 Watts output,
inbuilt 100 kHz crystal calibrator. Com-
plete with 24V DC PSU.

\$65

MAIL ORDERS WELCOMED. Please allow pack and post on items listed on this page. If further information required send a stamped SAE for immediate reply from the above address. Larger items can be sent F.O.B.

amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA, FOUNDED 1910

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QSP

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There is no doubt the real concern for the WIA these days is to stay alive in the present financial situation.

Some may think the solution lies in returning to the beginning and starting all over again.

Others more realistically acknowledge the results of inflation and realise there can be no going back.

Yet again there is a growing number who see the necessity for the regrouping of the entire forces of the WIA.

Have we over-reached ourselves in providing the kind of service members expect but which many are unwilling to pay for?

What profit areas have been missed by the Federal Council to offset our losses? Your executive knows there can be no going back. If the Institute is to continue the only way is to go forward.

Over half the costs of the Executive go into the production and distribution of the journal. What would the Institute be like without AR?

Certainly we could turn out a small semi-duplicated, cheap version of AR, but at this year's Federal Convention the matter was considered in depth and the Council were unanimous in their decision that it was essential for AR to continue in its present form!

Could we throw away our modest EDP system and go back to addressing plates? Let the divisions collect and account for membership dues?

Return to voluntary effort in maintaining membership records?

If anyone can come forward to do a cheaper and yet equally as good a job as our present EDP system we would like to hear from him at once.

We know a cheaper job could be done for a few hundred members, but we want something cheaper and better for the entire membership. We are still looking for it.

Did you notice that postages, wrappers and wrapping services, account for nearly one fifth of the costs of AR? Would it surprise you that you would get no change out of \$1,000 for the cost of the postage and stationery bills for the subscription processing.

The Executive is well aware of the costs to members of the Federal organisation. It reviews these costs frequently and constantly seeks to do what has to be done as economically as possible.

There is no ready-made solution. No easy way out. Unless, of course, the Federal Council gives directions to abandon many of the things now expected of us.

D. A. WARDLAW VK3ADW
Federal President

RETURN OF 50-52 MHz

Work has begun by the VHF Advisory Committee in preparing a case for the return to amateurs of the 50 to 52 MHz segment of the 6m band as required at the 1975 Federal Convention. Work is being done in two phases. Phase 1 is aimed at achieving a shared band arrangement for amateurs operating beyond defined service areas of Channel Q TV transmitters and Phase 2 aims at full restoration. Both of these objectives could take a long time in getting any results even assuming there is success in putting forward a strong enough case. The VHFAC now needs the maximum amount of information from amateurs on the co-channel operations of TV stations and other radio services in any part of the spectrum. Not only as affecting Australia but also overseas. Have you anything useful to offer on this? Do not delay — please write at once to "VHFAC, PO Box 150, Toorak, Vic., 3142", in confidence if necessary.

FRAGMENTATION

The editorial in QST for May '75 quotes "One characteristic of amateur radio that continues to cause us some concern is fragmentation, the splitting up of amateur radio into a myriad of narrow interests which sometimes divide us internally and weaken the strength and unity which we must display externally". WIRU writes that in one respect this fragmentation is healthy but what does weaken the image of amateur radio is the on-the-air intolerance exhibited by some amateurs for those who have different interests.

SOLOMON ISLANDS

VK3YQ whilst in Honiara, spoke with the P & T Controller who happens to be the VR4AA. Visitors, he was told, could obtain an amateur licence on production of an Australian AOC (or photo of it) and payment of \$12 per annum (minimum \$3 per quarter). The amateur bands are slated to be the same as applicable in the UK and will probably continue after independence (some time in the future).

NEW PREFIXES

Radio Communication, June '75, advises that the call sign block CTA-C7Z has been allocated provisionally by the ITU to the World Meteorological Organisation.

IARU NEWS

April '75 QST advises that a revised Constitution of the IARU proposed by the RBG has been adopted by the Union. The new Constitution recognises the existence of the regional IARU organisations. The necessary two thirds majority was achieved in voting for its adoption.

RECIPROCAL LICENSING

Break-in for May '75 carries official advice that reciprocal licensing of amateur radio stations now exists between France and New Zealand (including Cook Is., Niue and Tokelau Is.). So if you hear an F4AA/2L1ZZZ you'll know what it's all about.

WIA NEWS

In July the Executive closely examined the expenses of the Federal body. The results appear elsewhere in this issue.

It is too early to say what the total subscription rates will be for each Division next year. Divisional activities are just as subject to inflationary pressures as are those of the Executive. It is at the Divisional level where more voluntary helpers working to sensible plans can effect greater savings than elsewhere.

At the Executive meeting in July David Rankin, VK3QV/5VIRH, the Secretary of the IARU Region 3 association, regaled the members with impressions from the Region 1 conference he attended in Warsaw during May. There is little doubt that the encouragement of the 'sports activity' of amateur radio in the USSR and Eastern bloc countries is likely to be very useful in the light of WARC 1979.

Work on uniformity of repeater conditions has continued. The Federal Repeater Committee in the person of John Harris, VK6ZRH came into action and work on 70 cm repeater parameters is obviously an early priority. The AARTG under Chairman Don Graham VK6HK was given the task of drafting suitable submissions to the authorities about RTTY.

The task of assisting with the revision of the PMG's Handbook was re-activated in advance of new regulations expected to become law perhaps later in the year. This work is in the capable hands of Geoff Taylor, VK5TY and Jack Martin, VK5EJ.

It was considered most important for the future of satellite operations in this part of the world that the Chairman of the Project Australia Group, Dave Hull, VK3ZDH should attend the Amstat experimenters meeting in Washington, USA in mid-March. The Executive funded his air fare after protracted negotiations failed to provide cash assistance from sources outside the WIA. All his other expenses were met out of his own pocket or through good friends, Amstat and others. The Executive sought financial assistance from Divisions and to date less than 20 per cent of the total has been raised. Thanks are given for the following —

VK7 — 60.00

VK1 — 34.50 (VK1WI 20.00, VKNP 5.00,
VK1ZT 4.00, VK1DS 1.00,
VK1DA 4.00, VK1AH 0.50).

10 m BEACONS

From IARU Communication July '75 comes an interesting beacon list starting with 28.165 MHz for PY1CK in Rio de Janeiro and VP9GA in Bermuda. Then follows as 28.170 ZL2MHF in Wellington, 28.175 VESTEN in Ottawa, 28.180 5B4CY in Ljansel, 28.185 G83SX in Sussex, 28.190 3B5MS in Mauritius and DL01GI on 28.195.

NEW PFXIX

From IARU news in QST June '75 mention is made of a special Memorial Meeting early in July at Skopje in Southern Yugoslavia and in conjunction with this event YU amateurs will be using the special prefix YZ for the remainder of 1975.

SAFETY

QST June '75 mentions that a notice which would have exempted electronic pocket calculators from the general restrictions on the use of electronic devices in aircraft was withdrawn. It seems there were enough reports of interference to navigational aids and the like by some models of calculator aboard some aircraft, particularly light planes and helicopters.

VK5 — 100.00

184.50

By the time this appears in print the 1975 WIA Call Book should have been available for about a month. Perhaps it should be emphasised that the call sign data derives from PMG Dept. not the WIA. For the first time the compilation of the Call Book was done outside Melbourne. It would be interesting to hear what the Group concerned thought about it all. Everybody involved with Call Book compilation should breathe a sigh of relief if next year's edition is done from EDP records. If this comes to fruition it is probable that WIA members will be designated with an asterisk and there should be less scope for error. Any WIA unfinancial would obviously not be listed as a member.

Another Customs problem arose in relation to frequency coverage of amateur band HF transceivers. The By-Law lists the bands available for use by amateurs in Australia whereas HF transceivers are manufactured for a world market. The whole question is under active negotiations with the appropriate authorities using the criteria prepared by the WIA last year for the Industries Assistance Commission.

The Key Section raised the question of a CW and telephony gentleman's agreement for the frequency bands to be used by Novices. This was referred to Divisional Councils for comments but it is obviously desirable that a decision should be reached before Novices are licensed.

Also as a result of WIA representations the necessity for ATV operators to obtain a special permit has been removed. With this change, of course, the —/T suffix disappears.

A letter explaining the objects and organisation of WICEN and advising that Brig Rex Roseblade, VK1QJ had been appointed Federal WICEN Co-ordinator was sent to the Minister for Defence.

The good offices of the PMG were sought to remove the ban on the Novice Examination deferred from 23rd June but no sign of any breakthrough was evident at the time this newsletter was written.

Afterthoughts

EXPERIMENTERS DELIGHT — APRIL 1975

On the circuit diagram there is a capacitor value shown as 10 nanof which should be 1 (one) nanof (0.001F). It is in the pre-regulator control section. Ten nF make the response too slow and the power switch will run hot. Also the ripple on the linear pass transistors becomes too high on 200W out. A new mains switch has been fitted.

This is a dpdt switch, the spare section of which is used to discharge the PRIMARY STORAGE capacitor via 5 to 10 ohms, 5W, and, also, via the reverse protection diodes the other big capacitors, when the mains switch is switched OFF.

The reason for this modification was the discovery that upon switching off, the remaining stored energy would sometimes be fed through to the output and cause the volts to go high. That is due to the collapse of the references upon switch-off.

The reverse protection diodes must be fitted on

both, the switching and linear pass transistors. If your load is sensitive to small spikes (50 to 200 mV), then use a twisted pair of wires for connection to the supply and earth only at the mains earth terminal provided on the front panel. Watch earth loops through CRO and other gear. Roll VK5ZIE

MODIFYING THE TRIO J86 RECEIVER

(By VK2AGJ)

A small gremlin has produced some errors in the process of publishing this article. Except for the points listed below, the circuit diagram is correct, and where any differences between the diagram and the text occur, it is the text which is incorrect.

1. Add a dot to 2N3819 8FO FET, lower 800P diode, converter heater switch and MPF105 mixer.
2. Add transistor type numbers to calibrator. 1st NPN ME2001, PNP 2N3838, 2nd NPN BC108.
3. Audio output capacitor is an electrolytic with the positive lead connected to the emitters.
4. 2N3838 audio amp is a PNP not NPN as drawn.

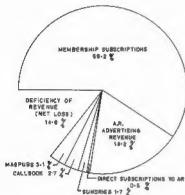
The author has subsequently found it necessary to fit a 4.7 uF filter capacitor to the negative supply to the RF gain control.

WHERE, OH WHERE DOES THE MONEY GO?

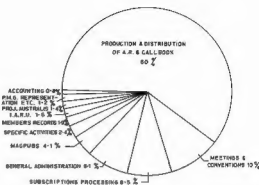
The Executive made an extensive in depth study of its finances as in July and came up with some interesting facts. These had long been suspected but never quantified.

The pie charts show the distribution of our finances as they appear at the middle of the current financial year.

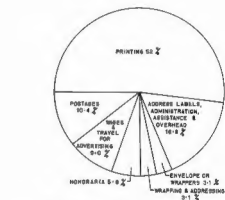
1975 INCOME
APPROX \$50000



1975 EXPENDITURE
APPROX \$40000



A.R. EXPENDITURE
APPROX \$37000



AUSTRALIAN VHF/UHF/SHF RECORDS - JULY 1975

NEW SOUTH WALES

			km	miles
50/52 MHz	VK2ADE	to VETAQQ	5-4-59	11,779
144 MHz	VK2ATO/2	to ZL2HP	2-1-66	2,344
432 MHz	VK4AT/2	to VK4KE/4	12-7-69	352
578 MHz	No claim			
1,296 MHz	AK4ZT/2	to AX4NO/4	12-4-70	402
2,300 MHz	VK2ZAC/2	to VK2BDH/2	19-5-73	159.9
3,300 MHz	VK2AHC/2	to VK2SB/2ZND/2	10-5-74	58.5
*6,850 MHz	VK2AHC/2	to VK2SB/2ZND/2	12-4-75	114.1
*10,000 MHz	VK2AHC/2	to VK2SB/2ZND/2	12-4-75	114.1

VICTORIA

*50/52 MHz	VK3ALZ	to XE1FU	1-5-59	13,545	8,418
144 MHz	VK3ZNC	to ZL2HP	13-12-65	2,092	1,673
432 MHz	VK3ZTD	to VK3ZDY	1-2-70	654	408.4
578 MHz	VK3AOT/3	to VK3ZKB/3	11-4-71	237	147.5
*1,296 MHz	VK3AKC	to VK7ZAH	17-2-71	430	273
*2,300 MHz	VK3ATY/3	to VK3ZHU/3	6-12-74	210.5	130.8
*3,300 MHz	VK3ZGT/	ZGR/3			
5,650 MHz	No claim		14-12-63	101.4	63.0
10,000 MHz	No claim				

QUEENSLAND

50/52 MHz	VK4ZAZ	to K6ERG	16-3-58	8,536	5,305
144 MHz	VK4ZAZ	to VK7ZAH	1-1-67	1,910	1,187
432 MHz	VK4KE/4	to VK4ZT/2	12-7-69	352	219
578 MHz	No claim				
1,296 MHz	AX4NO/4	to AX4ZT/2	12-4-70	402	250
2,300 MHz	No claims				
and above					

SOUTH AUSTRALIA

50/52 MHz	VK5KL	to WYACS/KH8	28-8-47	8,826	5,361
*144 MHz	VK5BC	to ZL2HP	29-12-65	3,149	1,957

*432 MHz	AX5ZKR	to AX7ZRO/7	15-3-70	776	482
*578 MHz	VK5ZJL/5	to VK5QZ/5	28-12-69	314	196
1,296 MHz	VK5ZSD	to VK3ZHU/5	28-8-59	121	76
2,300 MHz	No claim				
3,300 MHz	No claim				
5,650 MHz	No claim				
10,000 MHz	VK5CU/5	to VK5ZMW/5	30-12-71	99.7	59.5

WESTERN AUSTRALIA

50/52 MHz	VK6BE	to JABSP	30-10-56	8,833	5,490
144 MHz	VK6KJ	to VK3AOT	1-2-70	2,441	1,517
432 MHz	VK6ZOB	to VK6LK/6	25-4-66	106	66
578 MHz	VK6ZDS/6	to VK6LK/6	15-12-83	163	101
1,296 MHz	No claims				
and above					

TASMANIA

50/52 MHz	VK7LZ	to JA8IL	3-12-59	8,788	5,462
144 MHz	VK7ZAH	to VK4ZAZ	1-1-67	1,910	1,187
*432 MHz	AX7ZRO/7	to AX5ZKR	15-3-70	776	482
578 MHz	No claim				
*1,296 MHz	VK7ZAH	to VK3AKC	17-2-71	438	273
2,300 MHz	No claim				
and above					

N.B.—Australian records are marked *

AUSTRALIAN EME RECORDS

144 MHz	VK3ATN	to K2MWA/2	28-11-66	16,761	10,417
1,296 MHz	VK3AKC	to W2NFA	6-10-73	16,713	10,365

AUSTRALIAN ATV RECORDS

432 MHz	VK7EM/T	to VK3ZPA/T	13-12-72	413	256.6
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Postmaster-General,
Adelaide, SA 5000
30th July, 1975

Mr. P. D. Dodd,
Secretary,
The Wireless Institute of Australia Executive,
P.O. Box 150,
Toorak, Vic. 3142

I have received your letter of 25.7.75 on behalf of The Wireless Institute of Australia concerning the deferment of the first Amateur Radio Novice Examination.

Industrial action was taken by the Professional Radio and Electronics Institute over organisational proposals and this matter is currently in the hands of the Public Service Board.

I have already initiated action which I hope will lead to an early settlement of this dispute.

Yours sincerely, R. Bishop

Postmaster-General,
Canberra, ACT 2600
30th July, 1975

Mr. P. D. Dodd,
Secretary,
The Wireless Institute of Australia,
P.O. Box 150,
Toorak, Vic. 3142

I refer again to your letter of 9th June, 1975, on behalf of the Wireless Institute of Australia, concerning the delay in finalising the results of the examination for the Amateur Operator's Certificate of Proficiency held in February, 1975.

I agree that despite the intensive efforts of staff employed in the area, the results of the February examinations were not despatched as early as usual.

It should be noted, however, that several factors have contributed to the delay. In the main these are the current shortage of competent staff and the significant increase in the number of candidates who sat for the examination. These were further compounded by the need to divert staff from the marking of examination submissions to prepare the first examination for the Novice Amateur Operator's Certificate of Proficiency, which as you know, was scheduled to be held in late June, 1975.

Action is in hand to secure additional staff to overcome the difficulties being experienced in the examination area and it is expected that the position will improve in the near future.

Your suggestion concerning more modern methods of setting and marking examination papers has been read with interest and it is opportune to mention that for some time now, multi-choice type question papers have been included in examinations for one of the commercial operators' certificates, to supplement normal essay type papers set for the radio theory sections. You may not be aware that use of the multi-choice type of question paper has been extended to the theory section of the Novice amateur examination. I feel that this style of paper will greatly assist in minimising delays in the return of examination results to the candidates.

My officers are interested in using multi-choice type questions in the full Amateur examination and will be studying this matter when the staffing situation permits.

Yours sincerely, R. Bishop

ORIGINAL TECHNICAL ARTICLES

The Publications Committee recently discussed the copyright of articles in AR in the light of reprints being done by overseas magazines on a reciprocal basis. Where the author does not specifically reserve copyright in his own name and includes this with his article reprints in other society journals would continue as in the past. If other publications request permission to reprint, the request will be referred to the author concerned before agreeing to the request. In the past year or two many AR articles have been reprinted in overseas amateur magazines and due acknowledgement has been credited. AR is exchanged on a reciprocal basis with most of the world's major amateur publications and it is most encouraging to note how carefully it is read and reviewed.

1975 CALL BOOK

All being well the call book should be available by the time you read this. The price will be \$1.50 and it will contain some extra material not

RADIO GHOSTS

Reach out the trip and breaker, James, and turn the lights to 'low'
We'll watch the pushpull finals cool — see how their anodes glow.
And whilst they lose their rosy state, revert to black and grey
They'll mirror distance conquered, oldtimers gone away.
Ere Ohm's Law meant a thing to you, ere the Q code felt your hand
to vanquish isolation, be it seawise, air or land
I've warmed to friendly handgrips by Morse from men allied
To "fingertalk" with kindred when the wireless world was wide.
In retrospect I'm frozen in my pipedreams as they pass
Harold from St. Lucia, his sets' panels made from glass
With Alf his fervent cobbler whose fetiah was 'lo-lo-ess'
His tuners self-supporting, devoid of bolt or boss.
Here's Longreach Bill his Morse a treat to copy as he raced
His "skeds" with me a jousting-ground for learners as we paced:
And Harold from Rockhampton, phlegmatic on the key
Our weekly "meet" a tonic from "GE" to seven three.
Hail Andy from Mareeba, your signal's faint tonight
With Leighton at the Brisbane and they held the circuit tight
When once a cyclone struck the coast near his North Queensland Town
'Twas Andy with his two-watt rig who poured the story down.
A keening alternating current note, nine hundred cycles sweet
Comes up to strength and calls me in — the Morse is clipped and neat.
Ray Loving of the Eastern Moon's tied up in Panama
Tonight he'll toast old friends he says in a favoured Yankee bar.
Six weeks ago across my log his name was duly signed
Below a Kiwi's off a tramp: both callsigns underlined.
A singing crystal note swells up above the crowded band —
I reach across the narrow Strait — grasp Watto's eager hand.
There's Norm from Perth Westralia. He never seems to tire.
At twelve my time he'll go on shift, controls trains on the wire.
"We're one fifty north of Alice" comes the tap tap faint but clear
Tis Arthur from his mobile home. Been on the road a year.
The Lottery Goddess smiled on them and beckoned them away
From Melbourne with its sleet and noise, they're gone a year today.
Friend Trev from Bathurst pipes "GE" in a ringing crystal sound
Piezo-electrics bow to Trev — how many has he ground?
James old man my pipe is cold. They're passing by me still
Helene from Invercargill, Maree from Broken Hill
I'll bide a while, the moon rises high, the Taylor Range stands plain
A halliard frog against a mast — the chime whistle of a train
Cuts frostily across the Morse of men whose "fists" I knew
I'll turn my own ham license in, next month its falling due
Few "Morse men" are no longer "it" — the preent ham it seems
Won't "fingertalk" for pleasure, let the oldsters have their dreams.

MAT O'BRIEN ex VK4MM

included in previous issues. Remember one thing — the call sign data is that which was provided to us by the PIRG's Department. Do not write to the Institute saying your address or other details are incorrect in the Call Book or are not included.

FRAGMENTATION

"Indeed!" — says the writer of the editorial in QST May '75 — "one characteristic of amateur radio that continues to cause us some concern is fragmentation, the splitting up of amateur radio into a myriad of narrow interests which sometimes divide us internally and weaken the strength and unity which we must display externally."

NOVICES AS WIA MEMBERS

Are very welcome indeed. The 1972 Federal Convention Motion 72.17.04 set out the policy that Novice Licensees may be admitted as Associate members. Some people believe this would be correct for Novices under the age of 16 which is of course the minimum age limit for other amateur licences. Perhaps some WIA Divisions might even now be looking at their Constitutions regarding membership and voting qualifications apart of course from the ACT Division where their Constitution is of more recent date than the uniform divisional constitutions still in use elsewhere. Novices who are students or even pensioners could presumably qualify for the lower subscription rates but what about those in between?

Try This

with Ron Cook VK3AFW
and Bill Rice VK3ABP

KEN ANTENNA REPAIR

This is a suggestion for those in possession of the Ken KP202 using the standard but "Fragile" quarter wave whip.

If you are unlucky enough to break the whip (it usually breaks right at the plastic insulation bushing), a repair can be made by knocking out the centre pin and inserting a nail in its place. The nail is forced into the hole until it can go no further. Be sure the nail is long enough to make contact with the terminal inside the Ken's antenna connector. If it is too long it can, of course, be trimmed back. The whip is then gently forced into the plastic until it touches the head of the nail and is then fixed into position with a suitable adhesive.

JOHN WICKHAM VK3YJW

AMATEUR BUILDING BLOCKS

PART THREE

H. L. Hepburn VK3AFQ
4 Elizabeth St., East Brighton, 3187

The third part of this series of articles describes a module to generate a low level sideband signal and a single band linear amplifier to raise this low level signal into the 25/30 watt region.

Section 2 — Unit D —

BALANCED MODULATOR/SIGNAL MIXER

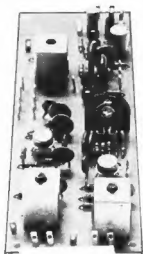
Figure 10 gives the circuit diagram of the four functions involved while Figure 11 shows the component layout on the 8 in. x 2 in. PCB.

(I) THE MICROPHONE PREAMPLIFIER

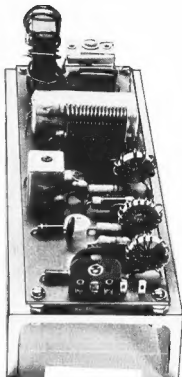
Input from a 2000 ohm dynamic microphone is filtered for RF by the F29 RFC and associated capacitors and is amplified in a 2N3565/2N4249 NPN/PNP feedback pair. A 22k on board trimpot (or panel mounted pot) provides control of the audio level into a 2N5245/2N3565 FET/Bipolar pair having a very low output impedance to feed the signal ports of the balanced modulator via a 10 mF electrolytic. This capacitor is connected between two PCB stakes so that easy access to the board for audio is available and allows the balanced modulator or the pre-amplifier to be used separately if desired.

THE BALANCED MODULATOR

As for the receiver mixer in Unit A and the product detector in Unit C, use has



UNIT D



UNIT E

again been made of the 1496/796HC type of device.

Audio is fed to pin 1 while pin 8 receives input either from the auxiliary BFO crystal oscillator offtake in Unit C or from the crystal oscillator provided on the board under discussion. If used as part of a transceiver the BFO injection can come from the receiver but if the module is used as part of a separate sideband generator the on board oscillator can be used.

Balancing to give minimum oscillator

feed-through is by means of the 22k trimpot between pins 1 and 4. In the layout used, output at the BFO frequency is some 50 dB below the input level at 9 MHz.

L8 is bifilar wound and is resonated by C8. A link in L8 gives a low impedance USB output which normally goes to a filter to strip off the unwanted sideband and further reduce the carrier level.

For best operation the BFO input should not exceed 60 MV RMS while the audio input should be below 300 MV RMS.

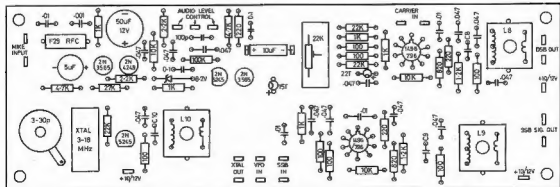


FIGURE 11 — UNIT D — COMPONENT LAYOUT



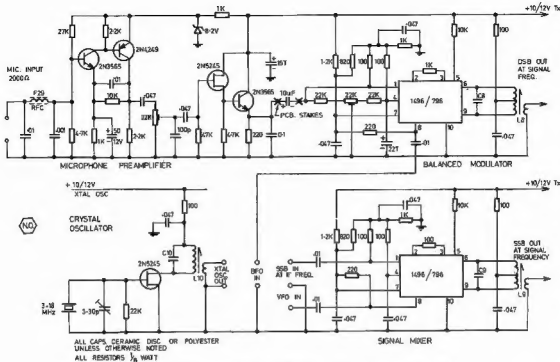


FIGURE 10 - UNIT D - BALANCED MOD / CRYSTAL OSC. / SIGNAL MIXER

Table 2.7 below gives coil and capacitor data for L8/C8 for the most popular IF frequencies.

(iii) THE CRYSTAL OSCILLATOR

The crystal oscillator provided on the PCB of Unit D is exactly the same as that provided in Unit A. Coil and capacitor data for L10/C10 is the same as that given in Table 2.5 for L5/C5.

As indicated in (ii) above, the function can be used to provide the carrier input (at IF frequency) for the balanced modulator if it is not available from other sources.

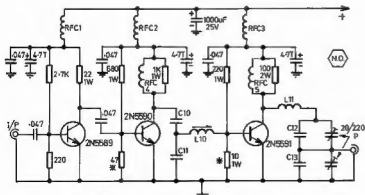
Alternatively it can be used in conjunction with the balanced signal mixer where a fixed frequency from the crystal oscillator can replace the VFO input to the signal mixer to provide a fixed, single frequency output.

If neither of the above facilities is required the crystal oscillator components are simply omitted.

(iv) THE SIGNAL MIXER

After DSB has been generated in the balanced modulator and one sideband removed in a suitable filter the resulting SSB (usually at the IF frequency) has to be heterodyned to the required signal frequency.

The signal mixer is designed to do this. The oscillator input (pin 8) is fed with the



* MAY NEED ADJUSTMENT TO SET STANDING COLLECTOR CURRENT TO 25mA.

FIGURE 12 - UNIT E - 25/30 WATT LINEAR

TABLE 2.7

Freq. MHz	Primary turns	L8 Line turns	AWG	Slug	C8-pF
5.0	18 + 18	8	32	F18	150
8.0	13 + 13	6	32	F16	100
10.7	10 + 10	6	32	F29	100

Note to Table 2.7:

Coils are close wound on Neosid 722/1 formers — links are wound over the centre of the tuned winding.

TABLE 2.8

Freq. MHz	Tuned Winding	Link	AWG	Slug	C8
1.8	37 + 37	15	37	F18	470
3.5	25 + 25	10	37	F16	150
7.0	15 + 15	6	32	F18	100
14.0	10 + 10	4	32	F29	47
21.0	10 + 10	4	26	F29	33
28.0	10 + 10	4	26	F29	15

Note to Table 2.8:

All coils close wound on Neosid 722/1 former. Link is wound over centre of tuned winding.

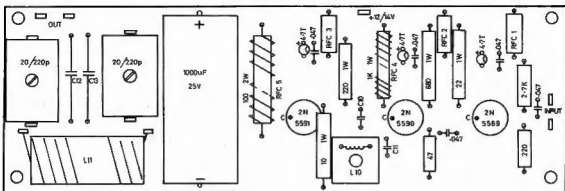


FIGURE 13—UNIT E—COMPONENT LAYOUT

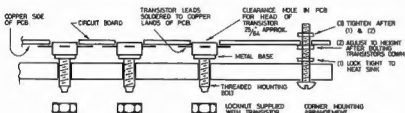


FIGURE 14—UNIT E—MOUNTING METHOD OF P.A. TRANSISTORS

VFO (for variable tuning) or a crystal oscillator in the VFO range (for fixed, single frequency output) while the signal input (pin 1) takes low level SSB at the IF frequency. The output tuned circuit L9/C9 is resonant at the required signal frequency. Note that L9 is bifilar wound.

For best operation the VFO input should not exceed 100 mV RMS and the SSB input should not exceed 300 mV RMS. Under these conditions around 100 mV RMS at signal frequency should be obtained from the output link.

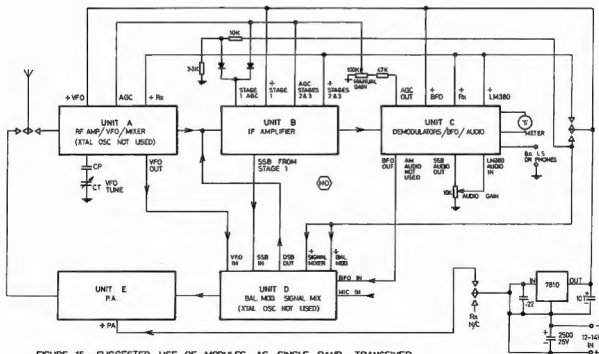


FIGURE 15—SUGGESTED USE OF MODULES AS SINGLE BAND TRANSCIVER

Table 2.8 gives coil and capacitor data for L9/C9

Section 2 — Unit E — LINEAR AMPLIFIER

This is a single function module providing linear amplification of signals over any one amateur band or other narrow frequency spectrum up to 30 MHz.

With a 13.6 volt supply, a 60 mW RMS input gives 30 watts RMS output into 50 ohms.

Figure 12 gives the circuit diagram while Figure 13 shows the parts placement on the 6 in. x 2 in PCB. Figure 14 shows the method of mounting the three transistors on the PCB and (very necessary!) heat sink.

Table 2.9 gives the values for the tuned circuit constants for the amateur bands whilst Table 2.10 gives the results obtained at 7 MHz with one of these modules.

Use has been made of the widely available 2N5589/90/91 series of power transistors. These are available from Dick Smith in Sydney or Radio Parts in Melbourne.

A 2N5599 is used as a class A resistance coupled amplifier to feed a 2N5590, this latter device being coupled to the 2N5591 output transistor via a tuned network comprising L10, C10 and C11. The output tuned network is L11, C12 and C13 with 20/220 pF Ducon ceramic trimmers across the fixed capacitors for "set and forget" adjustment.

The standing current for the 2N5589 amplifier should be around 100 mA with a 13.6 volt supply and no signal input. The 2N5590 and 2N5591 operate in Class B and the bottom base bias resistor values shown in Figure 12 may need adjustment to ensure that each stage draws in more than 25 mA with a 13.6 volt supply and no signal input. It is essential that a good heat sink be used — the simplest being a 6 in. length of 2½ in. x 1½ in. x ¼ in. thick "U" channel aluminium extrusion.

If a finned heat sink is used the flat centre channel will have to be at least 1 in. wide to accommodate the PCB. The "U" shaped extrusion has proven quite adequate in service and has the advantage of taking up the minimum cabinet space. The method of mounting the transistors to the PCB and the joint assembly to the heat sink is shown in Figure 14.

Figure 15 suggests one method of connecting Units A to E to give a single band tuneable SSB transceiver. Its physical form is left to the builder but a few comments are in order.

For all except the PA board, the HT supply is set at 10 volts using a 7810 or equivalent three terminal regulator. Note that the 0.22 mF and 10 mF tantalum capacitors are mounted as close to the regulator as possible.

It is assumed that a PTT microphone is used and that the appropriate signal and power changeovers are done by a relay operated from the PTT switch on the microphone. This is easier, but by no means obligatory, since the change from Tx to Rx and vice versa can be done

using an appropriate rotary switch. Note that AGC to the first stage comes from the normal AGC line during receive but is replaced with a fixed voltage on transmit, with the two silicon diodes acting as gates to pass the appropriate supply.

Use of a normal mechanical dial is assumed and its form is left to the constructor. In a later article it will be shown how a digital dial can be fitted.

Before describing the digital units it is

proposed to cover the FM and VHF modules and the next article will cover the two units involved

DISPOSABLE MATERIAL

Most general components can be obtained from the VK3 Disposables Committee at P.O. Box 65, Mount Waverley, Vic. It is hoped that arrangements will be made for the Committee to provide all but filters and crystals. In the meanwhile printed circuit boards can be obtained from the author.

TABLE 2.8 — P.A. COIL AND CAPACITOR DATA

Band	C1/C2 pF	Term	L96 AWG	Slug	L11	RFC5	C12 pF	C13 pF
160	470	50	32	F15	24 L. 16 AWG 1¼" ID 6.8 uH	18 L. 16 AWG ½" ID 2 uH	1000 + 20/220	4400 + (2-2200)
80	220	45	32	F15	18 L. 16 AWG 1" ID 4.4 uH	10 L. 16 AWG ½" ID 1.0 uH	500 + 20/220	2200 + 20/220
40	100	25	26	F15	16 L. 16 AWG ½" ID 2.2 uH	14 L. 16 AWG ½" ID 0.5 uH	220 + 20/220	1000 + 20/220
20	47	20	26	F29	10 L. 16 AWG ½" ID 1.1 uH	8 L. 16 AWG ½" ID 0.25 uH	100 + 20/220	470 + 20/220
15	33	16	26	F29	14 L. 16 AWG 5/16" ID 0.7 uH	7 L. 16 AWG ½" ID 0.2 uH	47 + 20/220	330 + 20/220
10	22	12	26	F29	15 L. 16 AWG ¾" ID 0.55 uH	5 L. 16 AWG ½" ID 0.15 uH	33 + 20/220	180 + 20/220

NOTES TO TABLE 2.8

- Coil inductances are approximate only.
- Coils L10 are close wound on Neosid 722/1 formers.
- The fixed parts of C12 and C13 are silver mica or Ducon 100 volt Type LRJ.
- RFC1 and RFC2 consist of 18 turns of 20 AWG enamelled wire wound on a ½" OD P25 Neosid toroidal core Type 4327R/P25/EC.
- RFC3 consists of 10 turns of 16 AWG enamelled wire wound on a ½" OD P25 Neosid toroidal core Type 4327R/P25/EC.
- RFC4 for all bands consists of 20 turns of 20 AWG enamelled close wound on the body of a 1.0 K 2 watt resistor.
- For 160 meters L11 can consist of 11 turns 16 AWG wound on a Ducon Q2 toroid 1¼" OD x ¾" ID x ¾" thick. The turns are spread over ¾ of the core.

TABLE 2.9 — POWER AMPLIFIER PERFORMANCE

2.10.A Vcc = 13.6V f = 7.07 MHz			2.10.B Vcc = 13.6V Drive = 60mV RMS			2.10.C f = 7.07 MHz Drive = 60mV RMS		
Drive mV RMS	Output Watts	f MHz	Output Watts	f MHz	Output Watts	Vcc Volts	Total Current Amps	Output Watts
60	30	4.90	0.3	13	3.6	30		
40	18	5.91	1.5	12	2.4	25		
30	23	6.98	2.0	11	3.1	21		
20	16	6.59	5.0	10	2.6	15		
10	4	6.84	10.0	9	1.6	8		
6	1	6.91	20.0	8	0.3	0.4		
		7.0	25.0					
		7.07	30.0					
		7.15	28.0					
		7.43	29.0					
		7.54	10.0					
		7.78	6.0					
		8.15	2.0					
		8.54	1.0					
		9.14	0.3					

NOTES

- Vcc was set at 13.0 volts, input frequency was set at 7.07 MHz (mid band) and output noted at various drive levels.
- Vcc was set at 13 volts and drive was set at 60 mV RMS. Output was noted at band centre and the frequency/output relationships established either side of this frequency.
- Maintaining a constant drive level and frequency, the load voltage was varied and output and total current noted.

VICOM INTERNATIONAL PTY LIMITED Manager: Peter Williams



New!

IC-202 144MHz SSB CW 3W TRANSCEIVER ARRIVING SOON!

This military style portable rig has just come off the ICOM production line and will soon be released for export. With 66 semi-conductors it produces 3w pep or 3w for cw in the range 144-145 MHz. Power is optional external 13.8V dc or internal nicads (UM-2).

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WIA Band Plan Xtals for IC22A/IC21A
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Anti-repeat 1-7
Simplex: 20, 28, 32, 37, 38, 40, 49, 50, 51, 52, 53, 61, 63.

The IC22A now comes complete with 6 channels from the WIA band plan and the VICOM 12 month warranty. Featuring solid-state T/R relay, PA protection and 5 helical resonators this popular mobile rig is the biggest seller in Australia in the Amateur 2 meter line. Price \$210 plus freight. Extra crystals \$8.50 pair.

The DV-21 PLL Digital VFO can be easily interfaced with the IC22A or IC21A or any rig with 44-45 MHz rx and 18 MHz tx. The VFO runs from either 13.8V dc or 240V ac and can scan either empty frequencies or those being used. In addition 2 programmable memories for favourite channels can be selected. Price \$285.

DV-21 COMBINATION DEALS:

IC22A plus DV21 **\$450**
IC21A plus DV21 **\$570**

IC-3PA 13.8V dc power supply has been designed for the IC22A/30A/60 series. Price \$78.



**IC22A
DV21**



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TRIO TV-502 transverter \$243.



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THE IC21A is the 10w base station or mobile (146-148 MHz) with variable power control, adjustable deviation, 24 channels, built-in discriminator meter, S meter, SWR meter, PA protection, modular circuitry, runs from 13v DC or 240v AC. Complete with three channels Price \$298

Monita-mini MR2 miniature 2m fm receiver with 12 channel positions. This palm size receiver has double conversion 455/10.7 IF and a sensitivity of better than 1 uV for 20 dB GS. Price \$98 includes charger (crystals extra).

NOTICE. Transmitting equipment is not sold to persons who do not possess the appropriate licence.

PROFESSIONAL QUALITY 2M FM RECEIVER MODULE Ideal as an auxiliary monitor for the shack or to keep the KVL posted (garbage not a good idea!) the kit comes complete with a single channel oscillator and a premium grade 11 element if ladder filter. The price of \$69.50 includes predrilled fireglass pcb, all components, if crystal filter instruction manual Add \$1 P & P

Features

- outstanding selectivity 90dB adjacent channel rejection
- 7.5 MHz bandwidth
- 10 uV squelch sensitivity 0.0-0.5 uV for 20dB
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- solid design, fully-shielded coils, stable cascade circuitry — no neutralisation required.

\$69.50

WHAT THIS WORLD NEEDS IS A GOOD \$25 SCANNER KIT! Here is our new 4-channel scanner board. It is small sized, includes LED indicators which mount in small holes added in your front panel. Two or more boards can be ganged for eight or more channels. Unit can be used with any AM or FM receiver or transceiver with squelch and electronically switched crystals. Oscillator circuits with directly switched crystals can be easily adapted. Price \$25 for the kit, including undrilled pcb, all components, instructions, LED indicators. Add \$6c for drill bit and \$1 P & P

KEN KP202 handheld 2 watts. Incld 4 chs (1-4-40-50), \$150.
Charger and nicads \$32

Trio 7200G 10 w incl 2 chs Special \$210

SEWIA SV-230 mobile rig, runs 25 watts! Price: \$210, includes 3 channels, mic, cables and mobile mounting bracket.

2 Meter Power Amps:

For Kens (2/25w) \$65

UHF Services Power Brick (10/50w) \$89

Power Band (10w/50w) \$85

Head Office . . . 139 AUBURN RD. AUBURN, VIC 3123. 82-5398

KENWOOD TR7200G 2m Transceiver

Kenwood is the export name of equipment manufactured by the Trio Electronics Group of Tokyo, Japan. They are of course well established in the amateur communications field with several models of both HF and VHF gear available on the Australian market at the present time. The TR7200G is the first piece of two metre FM equipment marketed here, although their earlier TR7100 was sold in large quantities in both Japan and in the United States under the SBE label. The current 2 metre models are marketed in the USA under the Drake label.

Kenwood is handled in Australia by the Weston Electronics Company at North Rocks NSW. The unit used in our review was supplied to us by Ham Radio Suppliers of 323 Elizabeth Street, Melbourne. Details of price and delivery can be obtained from them or by reference to their advertisements in this magazine.

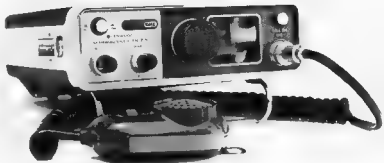
The TR7200G has much in common with other 2 metre FM rigs available at the moment, but as we will see, the Kenwood has many features that are both unique and interesting.

It is, of course, fully solid state and uses a total of 37 transistors, 2 FETs, 1 IC, and 24 diodes. Both dimensions and weight are slightly greater than other sets tested in the past, however it still rates as a very compact unit. It measures 180 mm wide x 80 mm high x 240 mm deep or in old terms 7-1/16" x 2-3/8" x 9-7/16". Weight is 2.5 kg which is approximately 5.5 lbs.

The appearance of the Kenwood is quite outstanding with the front panel finished in silver and light gray, with a satin chrome surround. Knobs are flat black and the cabinet is finished in a fine black crackle. The front panel is resplendent with a multitude of indicator lights which warn of any change from normal operation. Their functions will be later itemised.

As with all its contemporaries, the TR7200G has provision for 22 channels plus an external VFO input. The optional external VFO is pictured in the advertisement brochure and is designated as VFO 30. Apart from this, no mention is made as to how it operates, nor have any apparently made their way to this country. The set is supplied with crystals for repeaters one and four. Crystals for other channels can be supplied on order from Ham Radio Suppliers, however, correspondence with Weston Electronics in Sydney indicates that they have only heard of repeater channels one to four and simplex channels 'A', 40 and 50. It would appear though that in the future they might investigate the possibility of importing additional channels.

The mobile mounting bracket has provision to take a small padlock to frustrate the efforts of any would-be thieves. The



transceiver slides in and out quite easily and can be adjusted to four different angles of tilt.

The Kenwood operates from a nominal 13.8 volts DC and is rated to deliver 10 watts output to a 50 ohm load in the high power position and 1 watt in low. Power selection is by a front panel push button with visual indication provided by a colour change in the illumination of the meter. The channel selector is clearly numbered 1 to 22 plus VFO. Position 1 can be selected by pressing the "Call Ch." button regardless of the actual channel selected. At the same time a small panel light indicates that the "Call" position has been selected.

Accessories supplied include a good quality dynamic push-to-talk microphone, mobile mounting bracket, DC power cable with in-line fuse, external speaker plug (3.5 mm), chrome stand leg for home station use and an assortment of nuts, bolts and washers for attaching the mobile mount.

TR 7200G CIRCUIT DESCRIPTION

Starting with the receiver, a normal double conversion system is used with 10.7 MHz and 455 kHz IF frequencies. The front end uses a 3SK41 in both the RF stage and first mixer. Ceramic filters are used at both IF frequencies with the 455 kHz filter having a bandpass of 20 kHz at the 6 dB points. The receiver is thus a little more tolerant with high deviation signals than are most of its competitors. All of the receiver stages with the exception of the audio end are supplied with 8.3 volts from a series regulator stage. Returning to the front end, the first conversion oscillator starts off with crystals in the 15 MHz region. These operate in a parallel resonant circuit with about 40 pF across each crystal. Perhaps due to this higher than normal capacity, receiver stability is excellent. Output from the last multiplier stage is monitored with a transistor driving a LED indicator. This is situated in the

dial and meter escutcheon and gives an indication that the channel selected has a receive crystal installed. It would also of course fail to light in the unlikely event of a fault in the crystal or multiplier stages.

Transmitter circuitry commences at 12 MHz, again with about 40 pF across the crystals. The only IC in the TR7200G is used as the microphone amplifier and speech clipper stage. In a system similar to that used on the receiver, the output of the last transmitter doubler stage is monitored with a DC amplifier and transistor switch to operate the "On Air" light on the front panel. This will then only come on when the transmitter is actually delivering drive to the final stages. An elaborate protection system is provided for the final stage. This is actuated by a high SWR sensing circuit. The low power setting is variable over a wide range as it operates the same voltage regulating system used to provide the high SWR protection.

Another feature that appears to be quite unique to the Kenwood is a built-in public address system. A special socket on the rear of the set can be connected to an external speaker, then with the receiver switch turned fully counter-clockwise the microphone amplifier output is switched to the input of the receiver audio stage. At the same time the internal speaker of the Kenwood is disconnected. As well as the external PA speaker socket a normal receiver external speaker socket is situated on the back panel.

THE KENWOOD TITANIUM ON THE AIR

The transceiver is smooth to operate. The channel selector knob is relatively large and rotates with a satisfying clunk. When the rig is turned on with the push-on, push-off volume control, the channel selector and meter are illuminated and providing a receive channel is selected, the red LED indicator will also come on. The escutcheon is covered with a darkly tinted glass so that it is difficult to see which

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NEW PRODUCTS

CRYSTAL CLOCK AND DECADE COUNTER UNIT
This unit comprises a 10 MHz crystal oscillator and a eight decade counter units with TTL outputs at each decade and additional functions of divide by 2 or by 4. The crystal oscillator can be used also with any frequency crystal between 1 and 20 MHz to provide decade outputs of these frequencies.

The **WB250 WIDE BAND AMPLIFIER** can be used to measure the sensitivity of most frequency counters. The operation of this unit is simplicity itself. Just hold the probe of this unit near the oscillator of which the frequency is to be measured and the frequency will be read out on the counter. The principal advantages of this unit are **LOW COST, HANDY SIZE**. No actual connection to the equipment under test. Therefore no loading of the circuit. Very low level oscillator frequency can be measured with ease.



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WOUND INDUCTANCES**

No.	Dia inch	Turns per inch	B & W Equiv	Price
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1 16	1/2	16	3 No 3003	88c
2 08	3/8	8	3 No 3006	\$1.06
2 16	3/8	16	3 No 3007	\$1.06
3 08	3/4	8	3 No 3010	\$1.28
3 16	3/4	16	3 No 3011	\$1.28
4 08	1	8	3 No 3014	\$1.42
4 16	1	16	3 No 3015	\$1.42
5 08	1 1/4	8	4 No 3018	\$1.58
5 16	1 1/4	16	4 No 3019	\$1.58
8 10	2	10	4 No 3907	\$2.20

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channel is selected when the set is off. When in the high power position, the meter illumination is white, in low it turns green. With the green call channel light and the orange on air light the Kenwood can be a very colourful sight. Receive audio quality at first appeared to lack low frequency response; however, after use in high noise situations, this turned out to be a decided advantage. When first put on-air, reports indicated considerable roughness.

Investigation revealed that the microphone gain control was full on. Reducing this to the half way point cleaned up the audio.

Squelch control operation was smooth and progressive. However, when set close to the mute point, it was noticed that when external electrical noise such as from other cars at the traffic lights, the mute would open. This proved to be the only annoying feature of the set. I have checked with other TR7200G owners who report the same problem.

THE TR7200G ON TEST

Our usual series of tests were carried out.

Transmitter power output was checked with 13.8 volts applied. A Hewlett Packard 432A thermo-coupled power meter was used. On high power 12 watts exactly was delivered and on low power 1 watt. Current drain was 2.9 amps and 1.35 amps respectively. Current drain on receive rather depended on how many of the various indicator lights were on. We recorded the following: Muted: 375ma. Muted low power

selected: 500ma. Muted, low power and call channel: 550ma. Receive with normal volume 450ma, and with full volume 600ma. Transmitter deviation was set at 10 kHz. Figures obtained on receive sensitivity were excellent. The mute opened at 1uV

Quiescent at .5 uV —27 dB
1 uV —33 dB

Signal to Noise Ratio .5 uV —33 dB
1 uV —40 dB

The meter readings on receive were calibrated against the signal generator

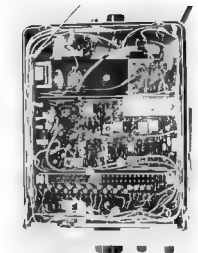
Meter	Input
2	.5 uV
3	1 uV
5	1.6 uV
7	2.0 uV
8	2.5 uV
9	3.1 uV
10	5.0 uV

Receiver audio output was measured on steady tone and at the onset of audible distortion was 1.5 watts. This meets the specification. A Marconi signal generator was used in the above tests. No further comment is needed as these figures are the best obtained in this series of reviews.

INSTRUCTION BOOK

The book is well written in so far as operation of the set is concerned. From a service point of view it leaves a lot to be desired. Only a circuit diagram is included. There are no printed board layouts or alignment instructions.

In regard to service, Weston Electronics advise that "Our Company is able to pro-



vide full service support and the supply of spare parts to our authorised dealers".

CONCLUSION

An excellent performer in all respects except the mute sensitivity to external noise. Crystal availability could be a problem but Ham Radio Suppliers can obtain crystals at around two weeks delivery for \$10 per set.

BOOKS OF INTEREST FOR AMATEUR OPERATORS

SEMICONDUCTOR HANDBOOK (Robert B. Torner)	\$7.40
FET CIRCUITS (Rufus P. Turner)	\$5.75
RTL COOKBOOK (Donald E. Lancaster)	\$7.00
UNIQUE IC OP-AMP APPLICATIONS (Walter G. Jung)	\$6.35
30 IC PROJECTS (Herbert Friedman)	\$3.75
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SPECIALIZED COMMUNICATIONS TECHNIQUES FOR THE RADIO AMATEUR (ARRL)	\$4.50
FM AND REPEATERS FOR THE RADIO AMATEUR (ARRL)	\$4.35
VHF HANDBOOK FOR RADIO AMATEURS (Herbert S. Brier, William I. Orr)	\$11.50
ALL ABOUT CUBICAL QUAD ANTENNAS (William I. Orr)	\$5.65
HAM NOTEBOOK (Edited by James R. Fisk)	\$5.10
TRANSISTOR SPECIFICATION MANUAL—6th Ed. (Howard W. Sams)	\$5.75
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Model TV-502 2 Mtr transverter for TS-520	\$200
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SPECTRONICS DD-1 digital counter for FT-101-B-E	\$150

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TH 3JR 10-15-20 M. junior 3 el Yagi 12' boom	\$135
TH 6DXX 10-15-20 M. senior 6 el. Yagi 24' boom	\$225
204 BA 20 M. monoband 4 el. TIGER YAGI 26' boom	\$190
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AR 22 for 2 and 6 M. and small HF beams	\$80
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4-conductor light cable for AR-20-22	20 cents per yard
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Model AR-2 RINGO 1/4 wave verticals	\$20
AR-2X RINGO double 1/4 wave verticals	\$35
ARX-2 extension for AR-2	\$15
A147-20T combination vertical-horizontal 2 M. Yagis, 10 elements each	\$60
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VK2AVA MESSAGE

With the wide choice of amateur transceivers available these days, many need unbiased advice.

In the 10 to 80m coverage range, if economy is important, one cannot pass up the YAESU FT/FP200 combination, an excellent buy and performer. But if mobile use is considered, forget it as the DC 200 supply then needed will bring it into the TRIO KENWOOD TS-500 price range, which is the next recommended choice. It has a better receiver, solid state, AC/DC supply built-in, excellent finish and don't overlook the pair of 6146-B genuine transmit output tubes.

The UNIDEN 2020 will soon be popular, it has so many extra features for so little more money.

Next comes the YAESU FT-101-E if 160m coverage essential and if one likes speech-processing or -clipping, personally I do not like it and don't particularly look forward to more abuse with excessive speech processing on our bands.

If HF bands mobile operation is the sole interest and also small physical size, look for the SWAN 40m mono-banders first, most mobile work is done on 40 metres anyway. Much dearer but with all HF bands coverage and small physical size is no doubt best provided by the ATLAS transceiver range.

Deluxe transceiver quality and performance, but only for AC power base-station use, is offered by the TRIO KENWOOD TS-900 and further the DRAKE TR-4-C or COLLINS KWM-2 or even SIGNAL ONE CX-7/11 if money is no concern!

For VHF FM operation there is such a multitude of good choices that economy and value of crystals supplied should be considered. For SSB VHF work there are some transverters available for use with HF transceivers. I do not recommend the SSB-FM combination transceivers for 6 or 2 metres, the SSB and FM sections of the bands are too far apart in frequency to provide optimum performance on both in one set. The small ARGONAUT is a nice source to drive a VHF transverter.

The next matter to consider is the antenna, even with a better than average location a lot depends on the care taken in the radiator department. Here again the choice is almost embarrassing, from the simple homemade wire dipoles to the mono- or multi-band verticals, junior or senior multi- or mono-band Yagis or multi band Quad

arrays. Forget about the G5RV dipole, there are different and better ways to string up a multiband dipole in a restricted space, even on 80 meters with only 100 feet between supports, an open wire tuned feeder dipole with an antenna matchbox will radiate many times better.

4 wave verticals, mono- and multi-band ones, are only half the radiating system, the other part has to be formed by a counterpoise, consisting either of a good conductive soil with some ground rods or a large number of radial wires or a bonded metal surface. DX coverage on 40 and 80 meters is best done with a good 4 wave vertical ground-plane.

Rotatable Yagis and Quads require mostly towers and rotators and HF beams are only safe with a HAM-II rotator. All together one can spend much more on a tower, rotator and beam than the most expensive transceivers cost. For low power and lighter towers and masts, a junior tri-band 10/15/20 metre TH3JR is the choice, but still needs a HAM-II rotator in most locations. Other tri-band Yagis, even the senior TH6DX included, are still compromises on 15 and 20 metre bands if compared with the performance of mono-band Yagis. The exception is the tri-band QUAD because it has full-size elements on each of its bands. That is almost the sole reason why Quad antennas outperform Yagis, it is unfair to compare them with tri-band Yagis. But Quads are more difficult to erect and require stronger supports, as towers cannot be guyed up to their tops with Quads. A lot of hard work and time in assembly, choice of materials and tuning-up plus problems of future repairs can be saved by choosing the sturdy Hy-gain Quad antenna.

However nothing can outperform on 20 metres the 4-element monoband Hy-gain 204-BA, the so-called TIGER-ARRAY. There are a few 40m Yagis in use down here, mostly of reduced size with some sort of loading of the elements, but most are homebrew. Anybody requiring advice on reduced size 40m Yagis can ask for my own, frequently frustrating experiences with 40m beams.

Arie Bles.

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HIGH PERFORMANCE 2m PREAMPLIFIER AND CONVERTER

Brian Richardson VK4CCR
20 Pescoek St., Leichhardt, Qld. 4305

With rising activity among SSB stations in the lower part of the two metre band, and the availability of high performance VHF MOSFETs, VK4CCR decided to build a better front end for his two metre transverter. The project started off with a preamplifier, which is described first.

PREAMPLIFIER

The MOSFETs selected, because of their ready availability and low cost were the MPF1000, or the equivalent 3N210. These devices are capable of 15dB gain and better than 2dB noise figure at 150MHz. The first circuit tried was the one shown in Fig. 1, but it proved disappointing mainly due to the difficulty in optimising the source impedance seen by the FET. The tapped coil method will work if you are able to determine the Q and coupling coefficients between the two sections of the tapped coil, but this poses problems at VHF, and is difficult to repeat on a production basis.

The 3N210 will only give minimum noise figure for a signal-source impedance of 375 ohms and a drain current of about 10 mA. The circuit in Fig. 2 is the one finally used as it allows continuous adjustment of the source and load impedances. C1 and C4 match the input and output impedances, while C2, L1, and C3, L2 tune to resonance. C1 and C4 could be made fixed values, but it was considered desirable to leave them variable to compensate for different antenna and load impedances. For those who wish to use a fixed input capacitor, the equations in Fig. 3 should help.¹

The values of L and C2 are determined by the bandwidth, i.e. QL at 144 MHz. It should be noted that Qm and QL are two different quantities.

Construction

The coils should be at least 1/4 in. above the board, and all of the RF conductors should be short and wide to minimise stray inductance. A small shield placed across the FET will prevent possible instability. Do not remove any more copper from the circuit board than necessary.

Alignment

The preamplifier may be tuned by using an S meter, or receiver quieting as an indication, but slightly better noise figures will be achieved if a sensitive audio voltmeter is used to detect maximum recovered modulation from a good signal generator. Using a tunable audio filter and a millivolt meter noticeably less gain is achieved than by tuning to an S meter, but a better noise figure results.² The only difference in adjustment between the two methods will be slightly different positions for C1 and C2.

Performance

The new preamplifier was compared with an optimised 3N140 preamp. The 3N210 provided a SINAD figure (measured on a noise and distortion meter) of 12dB from a signal input at least 6dB below that required for the 3N140.

TWO METRE CONVERTER

The converter, Fig. 4 (which followed the preamplifier project) was required to be easily adaptable to any IF from 6MHz to 30MHz. An onboard oscillator was to be used, eliminating the risk of feedback between the front end and oscillator, which experience had shown to be a problem, and enabling the existing transverter oscillator to be used. The injection should be 1 volt to gate 2 of the MPF121 mixer for best results. The mixer load is the only tuned circuit which needs changing for different intermediate frequencies. After much thought, it was decided to incorporate an IF amplifier with a 16:1 broadband balun for output matching, and variable

gain to prevent overload of the following receiver. Some IF gain was thought worthwhile as the FT200 tends to lack sensitivity on 28 MHz.

The balun was set up on a HP 250B receiver bridge to ensure broad band operation. It will, if constructed as in Fig. 5, give a flat response from 6MHz to 50MHz. If a 200-300 ohm output impedance is desired, the tap should be across two coils instead of one used for 50 ohms. The core used is available from the VK3 components division.

Construction

The same method of construction is used as for the preamplifier, and the board will accept a 3N140 or MPF121 mixer. The oscillator injection must be via coaxial cable, or there is likelihood of instability in the front end.

Alignment

The IF gain pot should be set initially for maximum gain, as indicated by a rise in

$$Q = \left(\frac{R1}{R2} - 1 \right)^{-1/2}$$

$$C1 = \frac{10^9}{W Qm R2} \text{ pF}$$

$$QL = \frac{10}{BW} \text{ SW}$$

$$L = \frac{R1}{2 W QL} \text{ uH}$$

$$C2 = \frac{10^9}{W^2 L(uH)} \text{ Cln pF}$$

Qm = matching network Q
R1 = desired source impedance seen by the FET
R2 = 50 ohms
W = 1
fo = MHz
BW = MHz

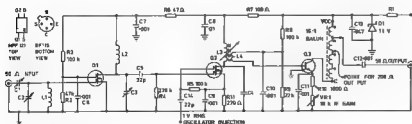
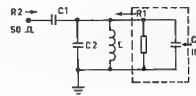


FIG 4 TWO METRE CONVERTER



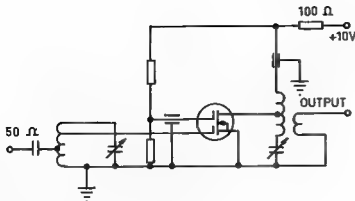


FIG 1 FIRST PREAMPLIFIER

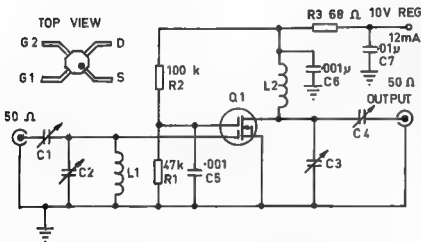


FIG 2 LOW NOISE TWO METRE PREAMPLIFIER

C1-C4 Philips T20 2-20 pF (Green case)

L1, L2 5 Turns 16g .2" ID .6" long mounted $\frac{1}{8}$ " above board.

Q1 MPF 1000 or 3N210 (Motorola).

noise output. A strong signal will be detectable through the converter and the IF transformer should be tuned up first. The front end tuning is as for the preamplifier. After tuning is completed, the receiver should show several S points of noise. If not, go back and check the balun

wiring. Several people have come to grief in this area already! Set the IF gain pot back until antenna noise in the absence of QRM lifts the S meter about S1 to S3, as this seems best. An AM signal generator can be used to find the optimum setting, by measuring S+N/N ratio.

4 WIRES TWISTED INTO A BUNDLE 4TPI

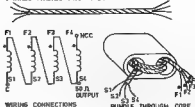


FIG 5 6-50 MHz BROAD BAND BALUN

Performance

A HP8654A signal generator with a 20 dB pad was set for 40% AM, and the sensitivity measured. At 0.2 uV the S+N/N ratio from the FT200 on AM position was 8 dB. The generator has very low leakage, and the attenuator was recently calibrated, so the figures are assumed to be accurate. On-air testing verified that the sensitivity and noise figure were good.

CONCLUSION

The two circuits described here are not one-off types, difficult to duplicate, or using hard-to-get components. Approximately 10 preamplifiers, and five converters have been constructed so far, and all have come up to expectations. The Ipswich and District Radio Club will make kits available, either in basic form or fully assembled and tuned, if there is sufficient interest. Enquiries should be addressed to the club, c/o 20 PEACOCK ST, LEICHHARDT, 4305

REFERENCES

1. Transistor Circuit Design; Texas Instruments Inc
2. High Frequency Designs, p224.
3. Semiconductor Noise Figure Considerations Motorola, AN-421

TWO METRE CONVERTER

- C1-C5 2-20 pF Philips T20 (Green case).
 L1-L2 ST 16 gauge, 0.2 in. ID, 0.6 in. long, mounted $\frac{1}{8}$ in. above board.
 Q1 3N210, or MPF-1000 (Motorola)
 Q2 MPF-121, or MPF-131
 Q3 BF115 or BF167
 R1 To drop supply to zener voltage, which should be between 10V and 12V (an 11V zener is shown), at 35 mA

All IF coils are wound with 30 B&S enamel wire on a Neosid former with an F16 slug. The form is mounted in a can for shielding

IF	C6	L3	L4
22-33 MHz	27 pF	15T 0.16" long	2T over centre of L3
17-25 MHz	27 pF	23T 0.25" long	3T
12-18 MHz	27 pF	27T 0.30" long	4T
8-12 MHz	39 pF	42T 0.33" long 2 layers of 21T	5T
7-10 MHz	39 pF	52T 0.38" long 2 layers of 26T	6T
5-7 MHz	39 pF	69T 0.25" long 3 layers of 23T	8T

BALUN CONSTRUCTION

The balun core used is the larger of the two sizes commonly available, being 14mm x 14mm x 7mm. Four strands of 26B&S enamelled wire are twisted in a hand drill, four turns per inch, for 5% in. The twisted bundle is wound through the core three times, so that the start and finish of the windings protrude from one end of the core. The protruding ends are untwisted and labelled start, S1, S2, S3 and S4, then finish, F1, F2, F3 and F4. The wiring diagram shows the connections of these wires. Make sure that the wiring diagram is rigidly followed, or the balun will not work.

vertical by joining the feeders at the station and this is often done by the use of clips, a very untidy and unworkable arrangement.

The little gadget, shown in cross section in Fig. 1, overcomes these problems. The diagram is self explanatory. A male and female coax connector are used to convert a coax feeder into a single wire by joining the inner and outer conductors at the female socket. The best position to use this device is on the antenna side of your SWR bridge (Fig 2). Simply unscrew your antenna. Insert the device in series and

reconnect. You now have a "vertical" antenna and you can use the "Forward" position of the SWR meter for tune up purposes and to continuously monitor relative output.

NOTE — SWR measurements made with this arrangement may be meaningless. The meter is only used as a relative output indicator.

If this "shorting device" is used in conjunction with an ATU it may be inserted at some convenient point to do the same job

My G5RV will load "as is" on 160 metres so I used it as shown in Fig 2.

Needless to say a good earth connection is essential with such a vertical system.

Finally, a word about the point of connection of the earth wire. I found that the best output was obtained (as judged by the "S" meter of other operators) if the earth connection was made right at the antenna connector (shown as "earth lug" in Fig 1) but this is a point for experimentation by the individual amateur.

See you on 160 metres.

TRAP DIPOLE FOR 80 AND 40 METRES

Described is a trapped dipole arrangement which is inexpensive and easy to construct. This antenna is suitable for those who have space limitations and difficulties in erecting a full size 80 metre dipole.

The ends of the antenna may be bent without loss of signal, and tests on 80 metres have confirmed this.

Tuning the 40 metre section makes no difference to the operating frequency of the 80 metre section, and vice versa.

METHOD OF CONSTRUCTION

(1) Connect a short length of antenna wire to each side of an insulator, say 16 gauge, about 8 in. long.

(2) Space wind 20 gauge wire 20 turns (as a start), connect 47 pF across coil, (coil diameter 2 inches, coil length 2½ inches.

(3) Grid dip to 40 metres at required frequency of operation, say 7080 kHz. Construct both coils exactly the same, slip coil over insulator, insert capacitor inside, give coil several coats of coil dope, fix insulator with epoxy cement.

(4) Drill a small hole in bottom of Pill Box, insert antenna wire, drill hole in lid, insert other antenna wire, screw on lid, cement around wires.

(5) Connect to dipole, raise to operating height, check SWR of 40 metre section first.

(6) This can be done by the same method as described in the article "20 MK Quad Tuning made Simpler" previously published, using the same GDO and Bridge. Note: Most antennas can be tuned using this method.

(7) If the GDO reads lower in frequency

(that is the dip in SWR meter) the 40 metre section must be cut shorter, say a few inches at a time, until the dip on the bridge meter occurs at the same frequency to which the trap is tuned. If the dip occurs at a higher frequency, the 40 metre section must be made longer.

(8) The same procedure is then carried out on the frequency required for 80 metre operation. Trim the 20 ft. sections.

Note: These tests must be made at normal operating height.

CONCLUSION

This antenna has been in operation for 2½ years and used at least twice weekly on both the 80 and 40 metre bands.

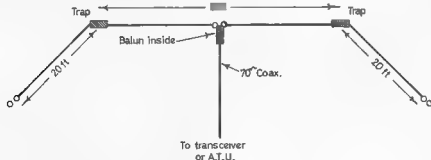
A recent inspection found the traps to be in excellent condition.

Comparison tests with the antenna and a G5RV have shown equal performance. ■

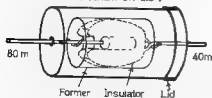
Harry Capsey VK2QQ

58 Ellison Street, Chester Hill N.S.W. 2162

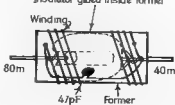
TRAP DIPOLE 40-80 METRES.



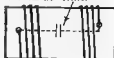
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47pF 1Kv breakdown voltage
fitted ins de former





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Newcomers Notebook

with Rodney Champness VK3UG

44 Rathmullen Rd., Boronia, Vic., 3155

A NOVICE TRANSMITTER — PART 1

Originally it had been intended that the description of the transmitter would only take two months in the magazine but to do the job properly it appears that as many as four months of description will be necessary. It is intended that this series of articles should not only be a constructional article, but indicate to you what the purpose of each component is and so give you ideas for your own projects in the future. Additionally, it is hoped that the detailed descriptions will assist you when you sit for the full amateur ticket.

This month the circuit diagram for the CW part of the transmitter is shown, along with a detailed parts list, and expected voltage and current readings in various parts of the transmitter. Most components can be varied in value by up to 50% in either direction, but it is preferable to use the values shown so that there is no problem getting the transmitter to function correctly. The only ratings that should not be reduced are the voltage and wattage rating of components. Those with sufficient experience will find enough information in this first part to build the transmitter successfully. Those with little experience should wait for a couple of months before starting to build the transmitter.

Next month a detailed description will be presented of how the transmitter works. The voltages to expect at various points in the transmitter are as follows with a 310 volt supply on AM and a 330 volt supply on CW.

	50V	plate AM	screen CW	screen AM	CW	CW	cathode AM	CW	CW	Grid
Periodic	245	290	130	160	11.5	14	1.5 mA			
Triode	180	180	—	—	5	5	not measured			

DC control line 16 volts unloaded, 12 volts loaded.

Component List for 10 watt 80 metre Novice Transmitter (RF Section) —

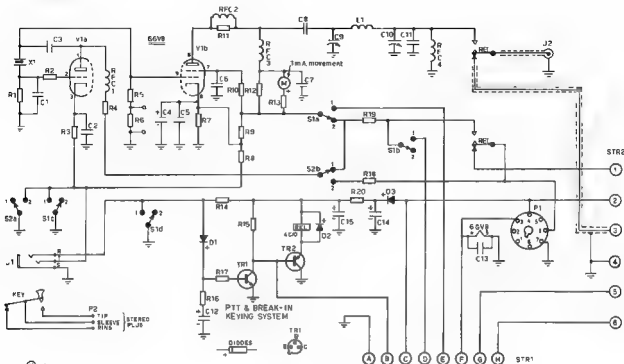
- R1 — 36k ohm ½ watt resistor, grid leak for crystal oscillator.
- R2 — 22 ohm ½ watt resistor, parasitic suppressor on crystal oscillator.
- R3 — 820 ohm ½ watt, cathode bias resistor, protective bias and isolator preventing RF going along keying lines.
- R4 — 22k ohm ½ watt, part of plate load for oscillator triode
- R5 — 27k ohm ½ watt, grid leak resistor for power amplifier.
- R6 — 1k ohm ½ watt, grid drive is measured across this resistor.

- R7 — 100k ohm ½ watt, part of voltage divider to limit cathode voltage on key up conditions.
- R8 — 220 ohm 1 watt, protective cathode bias and CW timing resistor.
- R9 — 270k ohm 1 watt, part of voltage divider to limit cathode voltage during key up conditions, works with R7.
- R10 — 22k ohm 1 watt, screen voltage dropping resistor, sets screen voltage and controls plate current indirectly.
- R11 — 82 ohm 1 watt, parasitic suppressor allied with RFC2, acts to damp any spurious oscillations.
- R12 — 100 ohm ½ watt, metering resistor in plate circuit of the PA.
- R13 — 6k ohm ½ watt, exact value of this meter multiplier is determined as per the text.
- R14 — 10k ohm ½ watt, portion of charging circuitry of semi-break-in keying system.
- R15 — 1k ohm ½ watt, part of TR1 collector load, emitter resistor for TR2.
- R16 — 1.5k ohm ½ watt, as for R15, plus acts to speed up relay pull in time.
- R17 — 100k ohm ½ watt, TR1 base discharge resistor, forms delay circuit with C12.
- R18 — 47k ohm ½ watt, supplies HT to crystal oscillator in netting position.
- R19 — 440 ohms 2 watts, 2 x 1 watt 220 ohm resistors in series, to drop HT so that transmitter is not over power on CW.
- R20 — 22 ohm ½ watt, part of DC smoothing circuit of 12VDC relay and semi-break-in supply.
- C1 — 33 pF mica, ceramic or styrofoam, part of feedback network for crystal oscillator. Can be varied slightly to swing the frequency a small amount.
- C2 — 0.004 uF polyester or styrofoam, 180 volts working, cathode RF bypass.
- C3 — 440 pF mica, styrofoam or ceramic, DC isolating capacitor for crystal.
- C4 — 10 uF 100V electrolytic, part of CW timing circuit, as well as audio bypass for modulated DC current through valve.
- C5 — 0.0047 uF polyester or styrofoam, 160VW, RF cathode bypass.
- C6 — 0.001 uF 630VW polyester, ceramic, styrofoam, screen bypass for RF but too small for audio bypassing, so that screen swings with modulation.
- C7 — 0.001 uF 630VW polyester, styrofoam or ceramic, RF bypass on plate circuit of PA. Works in conjunction with RFC3.
- C8 — 0.001 uF mica or similar, 600VW, RF coupler to tuned circuit, stops DC from being applied to these RF components.
- C9 — 15-415 pF large size tuning capacitor, single gang, relatively wide plate spacing required so that flash-over does not occur. Single gang needed but dual gang from old radio suitable. Tunes circuit to resonance.

- C10 — 900 pF twin gang miniature tuning gang, solid or air dielectric, acts as transmitter loading control.
- C11 — 560 pF mica or styrofoam, used as additional loading capacity for 50 or 75 ohm loads (aerials).
- C12 — 1-2.2 uF 16VW electrolytic capacitor, part of semi-break-in timing circuit.
- C13 — 0.01 uF low voltage ceramic, polyester, acts as RF bypass on heater line.
- C14 — 470 uF 16VW electrolytic capacitor, main reservoir capacitor on relay power supply.
- C15 — 25-50 uF 160VW electrolytic capacitor, final smoothing capacitor for relay power supply.
- D1 — OA91-EM401, 50 mA 50 volt diode, time constant charging diode.
- D2 — OA91-EM401, 50 mA 50 volt diode, transient suppressor.
- D3 — EM401, 1 amp 100 volt silicon diode, half wave 12V DC power supply rectifier.
- V1 — 6X8 television vertical valve, used as crystal oscillator and power amplifier.
- TR1 — BC108 or similar small signal silicon NPN transistor.
- TR2 — 2N3638-AC128, medium signal PNP silicon or germanium transistor. Used as switch to apply actuating voltage to the relay.
- Relay — Small relay with 4 sets of change-over contacts with a coil resistance of at least 50 ohms and designed to work on 12 volts. Used to change-over functions of equipment from receive to transmit and vice-versa.
- L1 — 21 turns of enamelled wire on a 1¼ in. diameter former with winding 1¼ in. long. Gauge of wire 18 to 26 B & S. Tank circuit for transmitter.
- RFC1 — Small 1 to 2.5 mH choke with 1 to 3 pies, part of plate load of the crystal oscillator.
- RFC2 — 7 turns of wire wound over R11, as a VHF parasitic suppressor.
- RFC3 — 2.5 mH 4 pi choke 60 mA rating, part of plate load for the PA, also isolates RF from HT DC circuits.
- RFC4 — 1 pi 1 mH choke, used as a DC return if C8 should break down.
- J1 — 6.5 mm stereo socket, used as the key jack.
- P2 — 6.5 mm stereo plug, used as the key plug.
- P1 — Octal plug, used on the end of a four core lead to supply voltage from the power supply to the transmitter.
- J2 — Aerial socket, Belling Lee or similar.
- S1 — 4 pole 2 position single bank switch, Oak or similar, used as the AM/CW mode switch.
- S2 — 2 pole 2 position rotary, slide, or toggle switch, preferably the latter due to its snap action. Used as the netting-normal switch.
- M1 — 1 mA full scale deflection meter, approx. 2 in. diameter, used to meter PA plate current.

CRYSTAL OSC

POWER AMP



10 WATT 80 METRE NOVICE TRANSMITTER

X1 — FT243 or HC6/U crystal for the 80 metre band. A suitable crystal socket is also required.

Knobs, nuts and bolts, terminals, wire, a metal chassis and miscellaneous other pieces are required such as a 9 pin valve socket.

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LOOKING AT THE FT101B

Over the last couple of years this column has mentioned the 101 on only one occasion. A lot has been written on the 101 series, mainly in the American Fox Tango club news letter and of course quite a few articles in Amateur Radio from time to time.

A couple of months ago I decided to take the bull by the horns and buy a 101B to see for myself just what should be done and, for that matter, what could be done without digging into the works too far. Just prior to this I received a letter from Bruce Mann VK3BM with a few of his ideas on the 101B.

So for the next couple of months, Commercial Kinks will take a hard look at the 101B and hopefully present a few simple ideas that can be incorporated by any owner.

BIAS SETTING

Firstly over to Bruce for his ideas:—

The final bias setting has to be changed whenever the set is changed from AC to battery operation. The potentiometer was inaccessible both with the set in the car and on the home station console. The internal diaspot was disconnected and leads

brought out to an external potentiometer. The existing wiring is well by-passed so there is no problem with instability.

NOISE BLANKER

The blanker in the more recent models of the 101 and also the 101B are factory adjusted by means of an internal potentiometer, to give blanking of spiky noise peaks without appreciable reduction in audio level.

The older models did considerably reduce the audio if worthwhile noise reduction was achieved, however I found that on the models I have had that excellent noise reduction, even of background noise and continually rumbling static, can be achieved by advancing the threshold adjustments, but at the expense of audio gain. To make full use of this advantage in operation it was necessary to bring this control outside the cabinet. In the late model 101 that I had, the noise blanker was quite a complicated affair rather haywire and spread out on top of the VFO housing. It included three or four small coils in cans, six transistors and some diodes. Earlier models had the blanker in the same position but it was much simpler. In my latest FT101B/2 the blanker is on a plug in circuit board towards the rear of the chassis. In this the potentiometer is of 10K ohms with one side earthed. In the FT101 referred to earlier the pot is 2.2K ohms and earthed

through a 3.3K ohm resistor. The noise blanker circuit of the earlier 101B appears to be the same except for the change of one transistor type number. The two external pots, one bias and one blanker, were mounted on a small panel flush with the front panel and attached to the small screw half way up the side of the cabinet. Two tiny holes were drilled in the cabinet to pass through some fine gauge hookup wire.

Bruce finishes with a comment that the earlier FT101's were unstable when used with a linear amplifier but that the latest 101B is quite stable under all conditions.

Now one small idea of my own I found the receive audio of the 101B rather hard with a predominant high in the response. After a period of listening the sound became rather fatiguing. I took the opposite approach to previous authors in this magazine who found bass response attenuation suited their ears. I connected a 64 mF electrolytic capacitor across the external 5 in. by 7 in. speaker. The high frequency hiss was gone and the sharp edge was removed from noise pulses. Try it — no internal modifications are needed.

Next month I will show two methods of reducing distortion on local signals, a problem that seems to effect some 101B owners but strangely not others. However there is no denying that this problem exists.

VHF UHF an expanding world

with Eric Jamieson VK5LP

Forrester SA 5233

Times GMT

AMATEUR RADIO RESULTS

VK0	VK0MA	Mawson	53.100
	VK0GR	Cassey	53.200
VK1	VK1RTA	Canberra	144.475
VK3	VK3RTG	Vermont	144.700
VK4	VK4RTL	Townsville	52.650
	VK4HIV	Mt. Mowbrall	144.400
VK5	VK5VF	Mt. Lofy	53.000
	VK5VF	Mt. Lofy	144.800
VK6	VK6RTV	Perth	52.300
	VK6RTU	Gaigatha	52.350
	VK6RTW	Albany	52.650
	VK6RTW	Albany	144.500
	VK6RTV	Perth	145.000
VK7	VK7RTX	Devonport	144.900
3D	3DAA	Adelaide	52.500

There has been quite a bit of pruning and resultant up-dating of the beacon list this month. The VK6 beacons have apparently been off the air for some time, as also has the P290A beacon. They have both been removed from the listing. Confirmation comes from Terry VK8ZCB that the Darwin beacon VK8VF has not operated since cyclone Tracy on Christmas Day, not even for last purposes. The Darwin Cub is still awaiting reconnection of the AC mains to the beacon site, plus repairs to the building, heater and antenna system. None of these beacons will be re-listed until definite information is received that they are operating.

I am back home again after a month's holiday, including a stay in sunny Queensland, and right at the top and in Cairns at that. Met a few of the boys in Townsville spent an evening with Eddie VK4ZEE and George VK4GS, down the coast a bit further hunted up Ross VK4RO at Ayr. At Rockhampton went hunting for my old friend Lance VK4AZ, found him just ready to catch a plane to Townsville, so missed on that one. Next in line was another well known acquaintance, Lindsay

VK4AAL (ex-421M). I spent a very enjoyable evening there, especially drooling over the mass of JA SBL, which he has a drawer full in fact. CH, let me in VK4 when the DX is around! Further down worked quite a number of the Brisbane boys on Ch. 1 repeater and on simplex Ch. 40 and 80. Whip to whip over 36 miles quite a good haul, even able to do it with 1 watt signal then till we got to Mildura where a number of the VK2 boys were working via their Ch. 4 repeater. A few bits of information were picked up on the trip as follows.

Ted VK4YG in Cairns said there is now an interest being taken on 8 and 2 metre operation in the New Hebrides, call area YLH. Ted also mentioned the Cairns boys were investigating the possibility of a 28 MHz beacon as a lead-up to band conditions on 6 metres. On the island of Guam ex-VK4IK, Laurie now with a K0S call sign is operating on 144.100 SSB with 1 kW, beaming south at 0900Z daily. He apparently is also trying to put a signal to any of our Ch. 1 repeaters. Perhaps the southern operators should be turning their 6 and 2 metre beams to the north and north east more often than previously. VK4 should be in the box seat for both Guam and the New Hebrides.

NEWS FROM JAPAN

Two letters are to hand from JA land. They contain some items which should interest us, so I have picked these out. They both come from Yoshiyuki AE JA1PLI in Tokyo. He reports last season 6 metre conditions were rather quiet in Japan, only three times worked K0S, and sometimes heard TVQ-O on 51.750 MHz. Normally they would expect to work HL9WJ and HM1G0, but nothing. In June this year J01 and JA8 both worked to K0S (Guam) on two occasions. On 4th July Yoshi and another amateur heard K0GAPH on 50.117, this being the Guam beam, 2500 m from Tokyo, but no replies to their 500 watt signal. He has worked 50 VKs, covering all calls, but mostly VK4 and VK6. He uses a 4CX250F with CW and SSB, and will have a new beam sent about September.

Yoshi's second letter gives a full listing from his own call book of 6 metre DX stations worked over the past 4 years, and it makes fascinating reading. Apart from a multitude of VKs, exotic call signs include K0KIK, ZK1AA, VS8DA, DU1ZAI, KR5CR, 5W1AR, KR6VJ, HL9WJ, KH9GRU, LU1MBJ, KJ.7, HA4H, HM1B9, K0ZAP, GZ1AA, K0KAO. In addition, he beamed WA and ZL. Additionally, other areas to be worked from Japan during cycle 20 included

KWS, W, J01, KWS and K0GR. The guys in VK some idea of the spread of 6 metre activity throughout the Pacific area, and probably indicates we should all be doing a lot more listening and perhaps calling to the north and north east.

It would appear the JA stations are showing quite a lot of interest in working VK, particularly the lesser worked areas such as VK1, VK3 and VK4. Working VK is not available to them, they operate their band along these lines: 50.000 to 50.100 CW, 50.100 to 50.250 SSB, 50.300 to 50.900 AM, and 51.000 and up for FM. Yoshi advises the beacons JA10Y on 52.500 in Tokyo and J01YAA on 50.110 (Marcus Is) are currently not operational, and possibly they may not be on again for this year.

It is interesting to hear from interested operators in other countries and I will do what I can to foster interest in Japan to keep them, and others in the Pacific through the line, looking this way when conditions are suitable. In addition to writing perhaps I should be doing something more on HF to stir up further interest.

MID-WINTER DX

Kerry VK8SU sends along his usual interesting snippets of his doings on VHF. Of special interest is the prolonged reception of JA10Y on 44.800, which was audible at varying strengths, day and night, from about 5-7.5 to 14-6, a longer period than when heard during the height of the summer season. The VK5 Ch. 4 repeater is often available. A subsequent letter mentions a 6 metre opening on 28-1 from 0153Z when WA worked, ex-421M (Gailine) was asked to leave VK5S at Orange was worked. Up to 0230Z worked VK2ZNS VK2ZND and VK2HZ. Rod VK2BJ then climbed on the bandwagon with a 6 x 9-4-4 signal to make his presence felt. Even had time to hear at my 215 alt station at 80 feet. The same day VK2ZNS and VK2VY were also worked, plus VK2ZMW at Coonabarabran 57 on 52.525 FM. All other VK5s were resting.

Kerry mentions the 10 metre band in his letter, advising of a net in Sydney on 28.500 MHz, most of which was on 28.500 MHz. On what appeared to be a dead band recently he gave a call on that spot and was answered by VK2IN 83. Again tried 28.5 during the above mentioned 6 metre opening and worked VK2IN and VK2AP. At 7.15 with the 215 alt station, a beacon on 28.175 MHz, 10 metres might be looking at more frequency as a guide to what may come on 6 metres. A

The Editor,
Amateur Radio,

W J Mordue, British Embassy
No. 1 Ichiban-Ko, Chiyoda-Ku
Tokyo 102, Japan.

Dear Sir,

I thought that the enclosed cutting from the local newspaper, the Mainichi Daily News, may be of interest to you or the readers of Amateur Radio.

JAPAN HAS MOST DXERS

The number of licensed amateur radio operators in Japan reached 290,247, or the equivalent of the population of Takamatsu last March, out-numbering their counterparts in the United States by nearly 10,000. It was learned Monday.

There are 14 times as many hams in Japan as in West Germany, the third largest nation for Amateur Radio operators.

Ham stations among TV, radio and other commercial wireless communication stations authorized by the Posts and Telecommunications Ministry account for 28 per cent of the total, it is said.

Ministry officials said the sharp increase in the number of hams reflects the spread of scientific knowledge today, was enough money to spare. A radio capable of transmitting over a radius of 100 kilometres costs between 62,000 and 70,000 Yens, and advanced communications equipment capable of reaching overseas stations costs between 170,000 and 1 million Yens.

The boom, they cautioned, was also giving rise to a number of inexperienced hams who cause jamming of TV and radio broadcasts and other commercial communications.

Lack of discipline on the part of some hams, such as bugging of police communications, was also pointed out by the public relations official of the Japan Amateur Radio League (JARL) founded in 1928.

JARL reports a rise in the number of physically handicapped persons who have taken up Amateur Radio and said it is compiling a textbook in braille.

Yours sincerely,
BILL VK3JRM

ARRL NEWS

In Radio Communication of June 1975 the ARRL Region 1 HF band plan is detailed. It is perhaps useful to compare the band plan with the official "gentleman's agreement" HF band plan in use for many years.

We use 3.5 to 3.535 MHz for CW only whereas they recommend 3.5 to 3.5 MHz, presumably because their band extends all the way from 3.5 to 3.8 MHz whereas ours stops at 3.7 MHz. Their RTTY channel is 3.8 MHz or -20 kHz whereas ours is 3.65 MHz. Their recommended SSTV frequency is 3.735 MHz.

On 40m they recommend 7 to 7.04 MHz for CW only (ours is 7.0 to 7.3 MHz) with 7.04 MHz, the same as ours for RTTY (+ or -5 kHz). Their SSTV is on 7.04 MHz as well.

For 20m the frequencies coincide with ours for CW only (14.0 to 14.1 MHz) and RTTY (14.00 MHz + or -10 kHz). SSTV is 14.23 MHz.

On 15m the CW on either side is the same as ours (21.0 to 21.15 MHz) but the RTTY frequency (+ or -20 kHz) is shown as 21.1 MHz against our 21.00 MHz. 21.34 MHz is the recommended frequency for SSTV.

The CW only portion of 10 metres is the same for both (28.0 to 28.1 MHz) but they have a RTTY frequency of 28.1 MHz (+ or -50 kHz) whereas we have none and they fit their beacons into the recommended segment of 28.2 to 28.25 MHz. Their SSTV frequency is 28.67 MHz, + or -5 kHz as applies to all their SSTV channels. 29.4 to 29.5 MHz is their recommended downlink of amateur satellites.

Of course, all the remaining portions of each band in both cases can be used by CW and tele-

phony stations. It is interesting to note they recommend 3.5 to 3.51 and 3.79 to 3.8 MHz as reserved for inter-continental working.

The article which is written by G2BVN, the RT secretary, says there was considerable discussion concerning electromagnetic compatibility of electronic entertainment equipment and it was agreed to set up a working group between conferences for which the RSGB will act as convener. Pressure on manufacturers is considered to be essential and an "interference free" television receiver.

Another item considered that the International Beacon Project is a valuable way in which radio amateurs can participate in serious scientific work.

In relation to the 70cm band plan some changes were made. Firstly to align as far as possible the 432 to 435.5 MHz segment with the 2m band plan (thus easing the problem of rememorising the plan) and secondly to make provision for a repeater scheme contained within the band 432 to 438 MHz — this is the only 70cm allocation available to a number of RI member societies. Their scheme defines an input/output separation of 1.6 MHz and has a marked similarity with the current 2m scheme. Inputs are in the band 433.0 to 432.25 MHz and outputs 434.6 to 434.825 MHz (1.6 MHz higher).

Band plans were also discussed for the 33cm band and for 1296 MHz to align with the 2m plan. Unfortunately France has lost her allocation in the region 1296 to 1298 MHz due to Government action — "a note of warning to all member societies" is the comment by the writer G3FZL.

Among the "other" matters discussed was an exchange of experience with lines between stations which are currently in operation in Austria, Czechoslovakia, West Germany and Holland. Typical of these is DBOVU which has an input on 432.6 MHz, an output on 145.4 MHz, and a bandwidth of + or -16 kHz. Very successful operation was reported both with this and other linear repeaters. It being found that the predominant mode of transmission through the repeater was SSB.

Magazine Index

With Syd Clark, VK3JSC

BREAK-IN May 1975

Hong Kong Conference Report, KH Set Assembly; A FET GDO/Wavemeter, Z Match or Triband Coupler; A Top-Cut Filter for Your Transmitter; Notes on the Wellington Walkies.

CG-TV May 1975

This is a publication especially for the ATV fan. It is published in England and deals with Elocan on the HF bands and CCIR standards for transmissions on VHF/UHF. A Modification to the Sony TVS-90UB, An IC Scan Failure Protection Circuit, An Image Orthicon Camera, Circuit Notebook No. 21 (Regular feature) this month — Motor Control Circuits.

CG April 1975

Inexpensive Surplus 100/800 Metre VFO Controlled CW Transmitter; My Audio Transducer; Amateur Radio — The "Invisible Man"; The Venus Scientific Slow-Scan TV Equipment, Antennas, Reader Response and 90 Metre Antennas, An Introduction to Active Filters, An Interference Tester, Receiver Updating Circuit, QRP VFO Design Notes; The Best Amateur Band for You, How to Pass Multiple Choice Test When You Don't Know the Answers. CG May 1975

The Wonderful HRO Receiver; The Atlas 210 and 215 Transceivers, 1974 CG World-Wide DX Contest, Phone Results, Operating RTTY on Two Metre FM, Standing Wave Ratio, Frequency Pre-Scalers, Driver-Final Design Notes; Sine/Cos Convention; The AM/ARG-44 Transceiver

BREAK-IN June 1975

3.3 GHz Long Distance Record; CG Nine Cms, Sealed Nicad Batteries, Maads Again

MOBILE NEWS May 1975

Membership report; The Hamburg Relay, The Renault 16TL (Suppression techniques)

RADIO COMMUNICATION May 1975

Dealing with Interference From Interference — The Social Aspect; Going QRT; TV Masthead Amplifiers and their Problems to the Amateur; Who Pays the Price, Investigation by the Post Office of Radio and Television Interference From Amateur Transmitters; The Interference Problem in 1973, Detuning Accuracy and Election for Oscar Station; Notes: The W2AU 11 Belus; RSGB Interference Survey; Building Blocks for the Novice.

RADIO 25 May 1975

Series of profiles of SARPL presidents. An Old Timer Remembers, A Foundation Member Reminisces, A 9 dB Gain Co-linear Antenna System (Looks like 144 MHz but, is not stated)

YRCS

with Bob Guthrielet

Methodist Mansa, Kaduna, S.A., 5554

Do you remember my last AR article in which asked for opinions on certain suggestions and my challenge for answers? Would you be surprised to know that I received one answer? But what happened to the replies from the VK 3, 4, 5, 6, 7 State Supervisors? This brings me to a further question — the YRCS notes read! And how the heck am I to furnish news about the activities of clubs, etc., if the Supervisors maintain silence?

I have received a copy of the Minutes of the SA YRCS Annual Meeting from the new secretary, Maxine McEvoy. Thank you, Maxine, and welcome to the YRCS. I'll be attending the meeting held at the WIA Headquarters in SA with an attendance of VIPs from the WIA SA Division.

Sart Groves, Editor of "Zero Beat" reported the healthy state of the magazine finances, largely due to a donation from the defunct Elizabeth Club. However Bart indicated the inevitability of a price increase. Club reports showed increased interest and activity, resulting in the effect that present Lecture Notes no longer be used in SA because they were totally inadequate, was carried unanimously. Allen Dunn, Federal YRCS Education Officer and Phil Emery, State YRCS Examiner will co-operate to ensure exams are based on the new syllabus. State Supervisors' please take note of the above resolution? (For information only)

A suggestion has been made that we should extract the best circuits from "Zero Beat" and publish same in collective format. This is a good idea and perhaps club leaders may have suggestions to offer. How about it, chaps?

NSW State Supervisor, Rex Black reports that Blue Mountains Branch of WIA has started an Outreach Programme to make the local citizenry aware that Amateur Radio is functioning in the area. Rex mentions having been asked by a Government Department to give a presentation in Amateur Radio from August 25th to September 5th. This is a Pilot course and could lead to operating courses in other centres. As I have mentioned before, publicity is an important factor in YRCS progress and I would recommend to all club leaders and supervisors that they approach local news media for coverage.

Did you take note of the item in the July 1975 WIANEWS regarding Novice Licenses? I quote, "Novice Licenses would be issued for a year at a time and would not ordinarily be re-issued for a third year. The first exam was designated easy so as to allow a standard to be established for the future. The review in 8 years obviously will show where changes are needed." Unquote YRCS could save the PMG time and expense with the following suggestion: that the Reg-0 Branch grant exemptions in Novice Theory for YRCS candidates who pass to YRCS Senior Radio Certificate (Stage 2), in Morse Code receiving and sending for YRCS candidates who gain the YRCS Radio Telephone and Wireless Telegraphy Certificates, in Regulations for holders of the YRCS R/T and W/T awards.

To close in the words of Channing. Every man is a volume, if you know how to read him.

Intruder Watch

with Alf Chandler VK3LCL

1536 High Street, Glen Iris, 3146

Notwithstanding the numerous agreements on frequencies, non-amateur stations will be heard in the exclusive amateur bands from time to time. This is unfortunate, but "read the club" in the Radio Regulations to the effect that an administration may assign any station to any frequency provided that no interference is caused to any

station of another country operating in accordance with the allocations table.

In other words, if amateurs fail to object to interference from non-amateur stations in the amateur bands, the administrator concerned is justified in feeling that it is complying with the regulations.

Accordingly many amateurs are participating in the WIA intruder Watch spending two or more hours a week looking for intruders. As a result, the fact that interference is indeed being caused by these stations, and reporting the facts to WIA intruder Watch. The various reports are matched up and the consolidated report sent through the appropriate government channels. At worst, a record of trespass of operators can be built up, to be used as "ammunition" against the offending government at the next international conference. Often the reports by amateurs to the WIA result in removal of the station.

The YLs and sell are enjoying the hospitality and privilege of travelling through the USA. We have met my long-known friend and fellow intruder watcher Bill Conklin, KKKA in Los Angeles, and friend visiting ARRL HQ to meet Dick Baldwin, W4RUL, co-ordinator of Watch Co-ordinator and now General Manager of the ARRL and his staff. We have been given VIP treatment wherever we have visited and enjoy meeting the people and viewing the scenery through the country.

On my return I shall continue my co-ordination of Region 3 and endeavour to arrange IARUMS throughout the Region. In the meantime I wish my stand-in and VK3 co-ordinator Ivor Morgan VK3XB every success in his endeavours.



The Ladies Amateur Radio Association has been formed. During this year several women, both licensed amateurs and SWLs, met to discuss the role of women in the radio hobby and the reasons why they could increase female participation in what has been, until now, a predominantly male activity. Notes were prepared for the VK3 Sunday morning broadcast with the intention of ascertaining the extent of Victorian women's interest in the amateur radio group. Breviaries, letters and questionnaires were sent to many licensed lady amateurs all over Australia asking for support and ideas for forming a nationwide association.

LARA aims to increase women's interest and active participation in all areas of amateur radio. It is no longer acceptable for women to be locked out of the shack or left to watch cooking demonstrations and throw radios at conventions and rallies. Admittedly there are some wives/girlfriends who will never be more than casually interested in the OM's hobby, but for those who do wish to join in, LARA plans a wide range of YL and YL/OM activities.

For those ladies who have (or have access to) a full call, a regular schedule is held on Monday nights at 8.00 pm. EASOP 3550 kHz and 10 MHz. The first such scheduled meeting was held on the 21st of July and YL operators from all over Australia took part. It was a very promising beginning. Those YLs who have not yet taken part are very welcome to come up on air and add their voices to the growing number of YLs meeting regularly for a chat in the shack.

LARA also plans to establish an award known as 'The LARA Award'. This award will differ from most in that licensed YLs as well as all licensed operators will be eligible to work towards it. Details will appear in a future issue of AR. YL activity on national field days and at state conventions is planned and organizers of these events are urged to get in touch with LARA in order to discuss YL activity on these occasions.

VICTORIAN DIVISION NEWS

As the year began in Victoria, activity has largely been confined to that state and so, in this issue of AR LARA (V.C.) news has been included to illustrate what can be done in other states. At the WIA (Victorian Division) council meeting held on July 10th, conducted by the President of LARA, a motion was passed by the Vic. Div. Annual General



Norma VK3AYL, President of Victorian Division of LARA.

Meeting expressing wholehearted support for the aims of LARA.

The first General Meeting of the Victorian Division of LARA was held on the 25th of July and Mrs Norma Boyle VK3AYL was elected President. A provisional constitution was adopted and a temporary committee formed. It was suggested that LARA hold classes in elementary radio theory for YLs to assist them to obtain AOCPL, AOCPL, or Novice qualifications. This is to be discussed at future meetings. A sked for Melbourne YLs was organised and takes place every Tuesday at 8.30 p.m. Call in via VK3RML.

Details of the first LARA YL/OM foxhunt on August 3rd were finalised. These foxhunts are family affairs, a barbecue being held at the conclusion of this one. A perpetual trophy has been donated and the name of the YL on the winning team will be engraved on the trophy. LARA hopes to hold several hunts each year. LARA will also be sending members to the VK3 South West Zone convention in October to compete in the contests and publicise LARA in NSW.

One of LARA's initial achievements has been the formation of a crystal bank. This involves building up a stock of crystals so that anyone who needs crystals for a short period will be able to borrow from the bank. Notices in particular will be helped by this scheme since operation under a Novice licence has to be crystal controlled. Many people have generously donated crystals to the bank but more are needed before the bank can start to operate. If you can help with crystals please contact R. Roper VK3YFF, 15/10 Brook St., Hawthorn, Vic. 3122.

Anyone interested in joining LARA and helping us grow can get in touch with the Secretary (Vic.), Jenny, and she will send information and membership forms on request. Jenny's address is: The Secretary (LARA), Ms J. Roper, 15/10 Brook St., Hawthorn, Victoria 3122.

20 Years Ago

with Ron Fisher VK3OM

SEPTEMBER 1958
With commercial television just around the corner, the Institute was carrying on a continuing battle with the PMG for the issue of Amateur Television Transmitting licences. According to the Editorial page of September 1958 Amateur Radio, this had been going on for the last nine years with the same answer every time, "Certain investigations have been made, but it is necessary to make further investigations after which the Institute can expect a reply to its representations".
Television was very much in everyone's thoughts and so, of course, was that great unknown, TVI, Who Will Be on the Air When TV and TVI is on? Hans Ruckert VK2AOJ showed how TVI occurs, how to recognise and cure it, and how a modern transmitter should be designed to eliminate harmonic radiation.

In a later issue, Hans fully described a transmitter following the principles he had set out.

The Legendary Don Knock VK2NO described his Triple Conversion Amateur Band Receiver. It was based on two Command Receivers and a crystal controlled converter for each band. Don stated that he got his inspiration from the Collins TS series receivers.

Noticed in this issue is my first attempt at Amateur Radio Journalism, a TMC Mobile Converter. Transistors were on the way. Philips had a full page advertisement for the OC72 which included a circuit for a push pull audio amplifier with OC72s in the driver stages.

Reading through the VHF notes I was obvious that it was the era of the 288 MHz modulated oscillator 71939 in push pull and the like. I am sure how well a push pull audio amplifier remained in it but it was good for just the same.

Book Review

THE RADIO AMATEUR'S HANDBOOK

Writing a factual book review in a few short sentences is quite difficult and we are perhaps fortunate that the publishers have, over the years, refined their comments about their publication in a manner difficult to improve upon. We therefore reproduce below their remarks which are correct in every way.

"The 1975 edition of THE RADIO AMATEUR'S HANDBOOK takes place with the latest technical developments, while retaining a solid foundation of fundamental theory and practical techniques for radio communication. Revised and updated information is included in the areas of receiving techniques, transmitter design, antenna construction, and portable/emergency-powered apparatus among others.

The technical staff of the American Radio Relay League has assisted Bob Myers W1FBY, in the preparation of the 1975 edition. Like its predecessor, the 52nd edition of the Handbook places the emphasis on proven design and practical information of a how-to-do-it nature. Noted for its technical accuracy and clarity of description, the HANDBOOK appeals to beginners and advanced amateurs alike.

Among the new construction projects included are a 100 metre and 100 ft, a solid-state single-band/CW exciter, a direct-conversion portable receiver for 20 and 40 metres, a transverter for 160 metres, a 10/15 metre preamplifier, a Unimatch antenna coupler, and a 6-element 10-band quater-wave antenna. This year the ARRL has chosen to print the latest edition of the Handbook upon a poorer quality paper than has hitherto been the practice. This reviewer feels sure that it will not detract from the usefulness of the publication and that the price has been kept at a reasonable minimum.

Review copy supplied by ARRL. Copies available from advertisers.

VK3ABC

Trade Review

MULTI-TAPPED POWER TRANSFORMER

Ferguson Transformers Pty. Ltd. have released two new multi-tapped transformer additions to their line of 20VA and 40VA low height transformers. These transformers will be useful for providing a range of output voltages.

Both bridge, centre tapped full wave, and half wave circuits can be used. Both provide a maximum voltage of 18 Volts and the windings can provide 1.11 amps for the 20VA type, and 2.22 amps for the 40VA type.

On last, the sample transformers were quiet and provided the rated outputs without excessive heating. The windings are tapped at 4.5, 6, 7.5, 9, 12, 15, and 18 volts.

Connections are made using shrouded quick connect leads which were supplied with the transformer.

The 20VA Transformer is Type PL1.5 — 18/20VA.

The 40VA Transformer is Type PL1.5 — 18/40VA.

IONOSPHERIC PREDICTIONS

WITH LEN POYNTER VK3ZQP

From September onwards the Ionospheric Predictions will return to AR and I trust they will be of interest to those who have missed them. I also hope to be in the position to offer further information to those who are following the Solar Flux and other indices.

LATEST SUNSPOT INFORMATION

December 1974 Predicted 20. Mean 20.4 R6 (six monthly smoothed) 25.4 June 1975 (Predicted April '75) was 17. Provisional mean 11.4 Predictions in June '75 for the next 6 months, July 9, August 8, September 7, October 6, November 5, December 4. Informal opinion suggests that March 1975 will see the minima. IPS advise that 2 spots of the new cycle have been noted; however it is still too early to recognise them due to the extremely slow decay of cycle 20.

Our problem with the predictions is the tremendous amount of data portrayed in the computer printout from IPS and the space available in AR. Initially I will try to cover two areas. Eastern Australia based on Canberra, and Western Australia based on Perth. If any correction factors emerge I will mention them.

For September the picture is not bright. With the predictions generally based on a low SSN there is not much consolation to offer. Conditions will vary daily. Around the 17th September should prove difficult if old Sol keeps up his antics.

Generally: 21 MHz should be watched from 2100-0400 across the Pacific and 0400-0500 from Japan across to Middle East and Africa.

14 MHz will be unpredictable. Generally, signals will range from poor to good depending largely on conditions; you will have to be there when it's good. Daytime across the various paths will be variable.

7 MHz from 0400-1000 Europe LP, North Central, South America and Pacific areas. 1000-2200 Middle East Europe 8P, West Africa 8P, South Africa, Japan, at variable levels.
From Perth 14 MHz, 0400 Africa, 0700-0900 North America, West Africa LP, 1000-1200 Europe LP, America East Coast 1200-1800, 7 MHz could be interesting 0700-0900, West Africa LP, 0900-1700 Pacific America West Coast, New Zealand 1600-2300, Middle East, South America, South Africa.

Next month I hope to include 80m in the summaries. DX is being worked on 80 and 160m if you know when and where to watch and listen for the experts. Being patient will pay off. Best of luck till next month.

Zurich figures courtesy Dr. Waldmann, Swiss Federal Observatory, Zurich. Prediction from IPS, Sydney. All times Universal Time.

PROJECT AUSTRALIS

WITH DAVID HULL VK3ZDH
OCTOBER PREDICTIONS

OSCAR 6 ("On" Days Only)				OSCAR 7			
Date	Orbit No.	Time	Long	Date	Orbit No.	Time	Long
2	13541	00.50	64	1	4001	B	01.15 69
4	13546	00.45	62	2	4013	A	00.15 53
5	13579	01.40	76	3	4026	B	01.09 67
6	13581	00.40	61	4	4038	A	00.08 52
9	13629	01.29	74	5	4051	B	01.03 65
11	13654	01.24	72	6	4063	A	00.02 50
12	13668	00.24	67	7	4076	B	00.96 64
13	13679	01.19	71	8	4089	A	01.51 72
16	13716	01.15	56	9	4101	B	00.50 62
18	13741	00.09	53	10	4114	A	01.44 76
19	13754	01.04	67	11	4126	B	00.44 80
20	13788	00.54	62	12	4139	A	01.38 74
22	13804	00.53	65	13	4151	B	00.37 59
25	13829	00.48	63	14	4164	A	01.31 72
26	13842	01.43	77	15	4176	B	00.31 57
27	13854	00.43	62	16	4188	A	01.25 71
30	13882	01.33	74	17	4201	B	00.24 56
				18	4214	A	01.19 60
				19	4226	B	00.18 54
				20	4239	A	01.12 68
				21	4251	B	00.12 52
				22	4264	A	01.08 66
				23	4276	B	00.05 51
				24	4289	A	01.00 64
				25	4302	B	01.54 76
				26	4314	A	00.53 63
				27	4327	B	01.48 76
				28	4339	A	00.47 61
				29	4352	B	01.41 75
				30	4364	A	00.40 60
				31	4377	B	01.35 73

QSP —

R.D. TROPHY

VKS reckon they will once again retain the R.D. Trophy this year. It is very interesting to receive news that the trophy was in Darwin when Cyclone Tracy struck. It was recovered from under tons of rubble from VKBMA's place. The trophy was damaged but has now been repaired and re-plated, with the exception of the shields, in gold — so writes the VKS Federal Councillor Ian Hunt, VK5QX. He says it looks extremely good and the change will serve to mark yet another event in the history of the trophy and also Amateur Radio.

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Call Book.

Lafayette HA800, \$110 ONO. FG Rods, solid 9/16 to 1/2 inches, 10 feet long, \$5 each. VK4WR, 8 Olive Ct., Nambour, Qld. 4560.

Yaseu FTDX100 with AIWA mike and SWR/power meter included. Has had very little use, is in first class order and gives excellent performance. \$350 the lot. Contact VK2AOR, L. J. Sparks, P.O. Box 102, Adamstown, NSW 2289.

Yaesu FT820 6m Solid State SSB 12V/240V inbuilt.
As new, few months old, in shipping carton, with
manual, \$370 or best offer. VK5ZTS, 6/11 Wakefield
St., Kent Town, SA. 5067.

Geloso 222 Tx 70W AM, CW 50-10m, good condition.
Geloso 209 Rx SSB AM, CW 50-10m fair cond., will
sell separately, best offer. VK2ADZ, 28 Probert Ave.,
Griffith, 2660, Ph. (069) 62 3718.

Swan 350 888 Transceiver with Swan power supply, mic. and two spare PA tubes, excellent condition, \$285. DC supply for above, \$40. H. Bone VK4NX, QTHR. Ph. (075) 36 1815.

Shack Clearance — complete equipment of the late Jack 2JH sold for the estate. Swan 350, "Communications Eight" Rx, 6m, 2m, 432 equipment, Tx and Rx, Converters, Test Instruments, Multimeters, grid dippers, Frequency meters, Power-Match with accessories, AWA Universal Bridge, Phones, Microphones

and many more items. No reasonable offer refused, ring Prof. Falsér VK22GF (02) 221 1855 for inspection.

Hallcrafters T37 Tx, 70/100 watts SSB AM CW, MOX/VOX, 80-40-20-15-10.2-8.146 final with 500W 240-110 transformer, OK, 20 and 80 needs adjustment other bands, \$140 ONO. National HRO Rx old timer, good order, all coil boxes 0.5 to 30 MHz, in current use, \$30 ONO. A. M. Doble VK3AMD, QTHR.

Geloso Tx—G4/228 with PSU and matching speaker, mike and manual, 80-10m SSB AM CW, as new, \$275. E. Wooley, 156 Kilgour St., Geelong, 3220.

Sharp GB72Q, 12 Ch., 27 MHz Transceiver, complete with xtal, mic., serial, plus roof rack mount, ideal for the mobile lot, \$100 CNO. Ronn McDougall VK2BPA, QTHR (new book). 3/16 Murray St., WYNDHAM, Victoria 3207.

FT/FP200. Very good condition, extra 28.0 to 28.5 MHz crystal fitted, spare set PA tubes, complete with microphone, cables, manual, in original pack.

Ham Radio, January 1974. To complete collection.
M. E. Hood VK1ZME, Box 572, Woden, ACT 2506.
Murdie, 48TH. Montreal 62 to 45 makes 3M2BY

QTHR, Ph. (03) 82 2152.

Crank-up Tower Nails 37 ft. or similar, Receiver Marconi or similar, VK2SI, 12 Ruswell Ave., Womersley, 2262.

licence for new amateur, fundamental frequencies of 80, 40 or 20 metres (CW section of band), for homebrew CW Tx. VK6WT, 105 Darglish Street, Wembley, WA 6014.

Manual for Ialac Model VCT-2 Valve Checker and
Multimeter, or opportunity to copy. D. L. Robinson
VK3ALD, QTHR. Ph. (03) 63 0461.

Trié 9R-59DS Circuit Diagram, handbook; also TCA 1674 FM maintenance handbook or circuit diagram, modifications for 2 metre operation, P29ZMJ, PO Box 2887, Menasha, Wisconsin, USA.

QRL? If not, Q5X 52020 for first 2½ minutes each five minute period from 0800 Sundays. I will Q5W

175 kHz Tapped Osc. Coils, Barlow-Wadley XCR-30 receiver. Jeff L-30409. Ph. (303) 545-3940.

Stolle Aut. Rotator. Price and availability to VK5XR, OXMR, 23 Bice St. Rotterdam, N.J. 08420.

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VK4CB	31/4/233	VK6RU	288/295
VK5AS	31/3/243	VK4VX	263/298
VK3AC	30/6/333	VK2VZ	258/281
VK3AHO	30/2/28	VK4TY	253/273
VK2APK	30/1/313	VK3TL	248/280
VK4VX	30/3/304	Open	
VK4FV	29/4/301	VK6RU	31/3/305
VK3WU	29/1/314	VK3VZ	31/5/323
VK4UC	28/5/293	VK4SD	31/4/335
VK4FJ	28/7/314	VK2APK	31/1/329
VK3WV	28/3/290	VK2VZ	31/1/336
VK3AHQ	30/1/331	VK2BO	30/6/325
VK2QL	29/8/328	VK3VZ	30/1/337
VK3YL	29/4/317	VK6MK	30/6/313
VK2PZ	29/1/304	VK2GK	30/1/311
VK2BZ	28/5/327	VK4PK	30/1/312
VK3XB	28/3/300	VK2VZ	30/1/312
		VK4TY	30/1/321
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VK2EB	108/1/10	WCU	
VK3WU	105/1/15	NSZ YKQC	100/102

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With the station passing the Morris Henry Meyers Award for the best station in the country, the WIAA lost a member who followed them. Amateur Code and Spirit to the letter and did much to ensure that the amateur service was well respected in the general community. Morris was frustrated that the FCC was not doing enough to protect the contests. He was also a top runner in the WIAA DXCC open section, with well over 300 countries. His skill as a gifted CW operator was acknowledged by his election to the Fine Operators Club and his membership in the International Association of World's best radio operators. His Immaculate C.W. was a reflection of everything he attempted and he attacked problems from a grass roots level with energy, determination, confidence and tenacity. He was a true gentleman and a true gentleman's understanding. He also conquered much through



Silent Keys

Mr. M. F. TIERNEY	VK2RT
Mr. A. E. BROWN	VK5ZL
Mr. C. J. W. COOK	VK8ZN
Mr. H. L. FOGG	VX8HF
Mr. H. W. A. HAWKINS	VX0VI

On Wednesday, July 28th, one of Australia's

On Wednesday July 30th, one of Australia's Amateur Radio Pioneers died. Arnold's licence is dated 1913; this makes 63 years of amateur radio. In the 1914-18 World War, Arnold was a radio operator and a tribute comes from his friends in The Mesopotamian Units Association. They are going to miss him at this year's "get-together".

Arnold was known throughout the world for his CW activities with his HF beam from his residence at 10 Flinton Ave., Torok. When the first Russian Satellite was launched, Arnold was reported in the "stop press", because he had the resourcefulness to tune in the "beeps" on his HF receiver. This and many other events colour the amateur radio side of Arnold; and then there is his fame as a painter.

He was a member of The Australian Institute of Accountants and The Stock Exchange of Melbourne. He enjoyed a game of tennis.

Arnold's brothers Hector and Otto caught the radio "bug" by taking an early interest in his work and operated the famous top

amateur station, 3BY Melbourne, on the broadcast band up until the commencement of the 2nd World War, when once again in the Hoist radio history, operations had to

It will take us some time to get used to his absence. In November he would have been the grand age of 25 years.

IVOR MORGAN UNION

their personality — with charm, understanding, tact and compassion — amply illustrated by his popularity and his bridging of the generation gap with so many friends amongst the "Z" calls. His cheery voice and his warmth of friendship and comradeship will be greatly missed — no less his intelligent interest and constructive contribution to amateur activities at all levels. A Past-president of the NSW Division and past-member of the Federal Executive, he served the WIA over a period of 30

As a member of the RAAF Wireless Reserve, along with many other amateurs, he was called up in September 1939. He saw service on the mainland and in forward areas, in the Borneo landing and in New Guinea and the Pacific. He was commissioned in 1941 and rose to the rank of Flying Commander, was mentioned in despatches and awarded the Order of the British Empire. In the post war years he often led the RAAF Signals contingent in the Sydney ANZAC Day March.

For 25 years he was a member of the Radio Club-committee of the NSW Bush Fire Council. He was also a member of the Quarter Century Wireless Association and the Institution of Radio and Elec-

His intense interest in communications led to a highly successful career with Gaisas where, as Communications and Electronics Manager he was able to work in a significant and complex field at a time of major expansion. Through this activity he served on the Advisory Boards at international level in task with the Government of Thailand extending over 20 years is worthy of special note. From his regular overseas trips he made numerous friends in professional and amateur circles and continued the communications link. In latter years he became a keen bowler and qualified as a national!

Morrin was an exceptionally fine man and citizen, with a great depth of faith and a strong grasp of the basic essentials. He was a deacon of his church and he enjoyed the warmth and security of his family and his home. May the tributes, the many friends and the wide representation, including the numerous amateurs who attended his funeral on June 13th, be a comfort to his widow Gwen and daughters Elizabeth and Rosemary, may happy memories abound for them, his many friends, and

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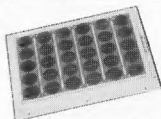
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